UNIVERSITY OF MICHIGAN
TRANSPORTATION LIBRARY

AUGUST 10, 1929

Railway Age

FOUNDED IN 1856

TRANSPORTATION LIBRARY
UNIVERSITY OF MICHIGAN

Progress

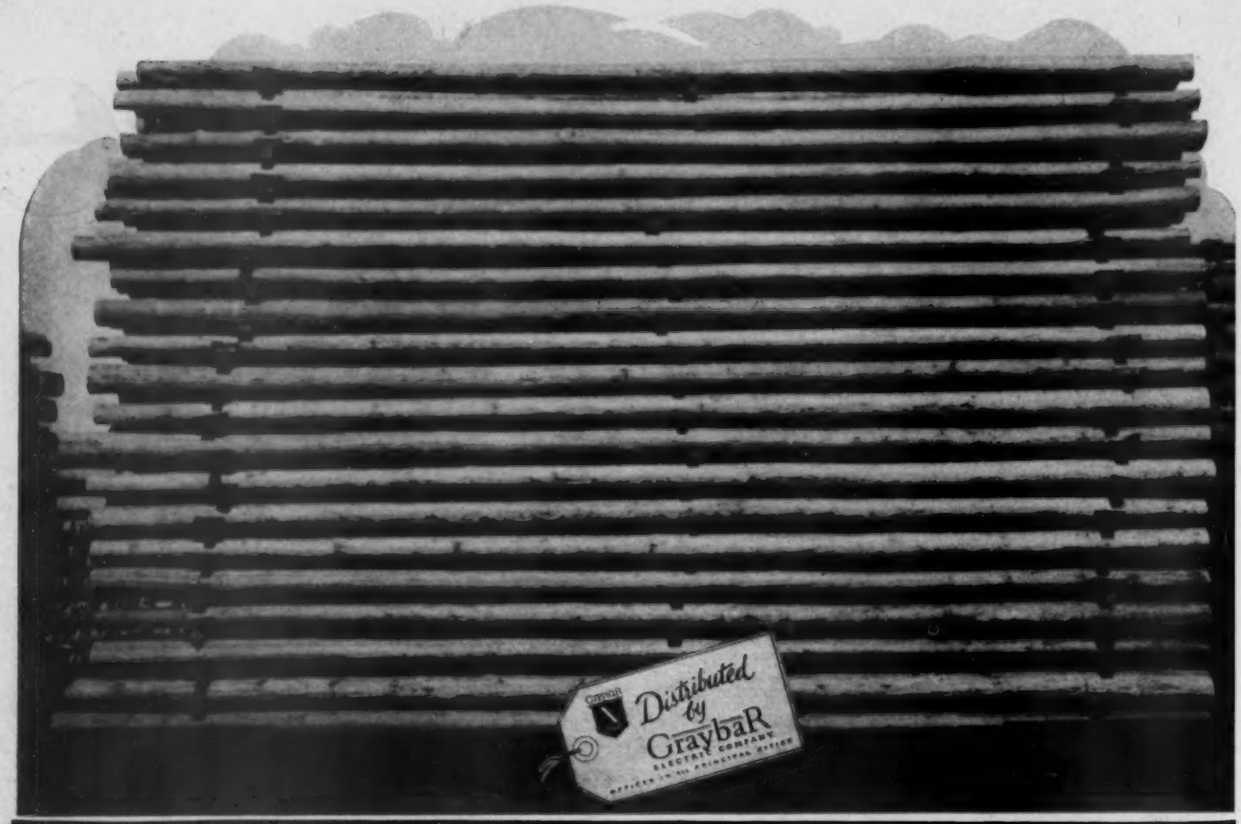
THE trend towards railroad dominance in the field of motor coach transportation continues . . . and unmistakable evidence points to great progress in the development of railway motor truck transportation.

Throughout the great expansion of coordinated rail and highway transportation, the Motor Transport Section, which is Section Two of the fourth issue each month of the *Railway Age*, has guided its railroad readers in developing their highway activities . . . and has pointed the way to greater accomplishments in the future.

With the present extensive railway operations on the highways the Motor Transport Section is of increasing importance. In its new and enlarged form this publication has materially added to its editorial scope and to its value to railway officers and manufacturers alike. Look for your next copy . . . with the August 24th issue of the *Railway Age*.

Alphabetical Index to Advertisers Page 56

Buyers Directory of Advertisements Page 50



Scientific control during seasoning, as applied by ***International,*** keeps the poles absolutely free from decay. The proper and thorough seasoning of poles assures a deep and uniform penetration of creosote oil.....Ample stocks assures prompt shipment of poles, framed prior to treatment according to your specifications, ready for the hole upon arrival.

International poles in service have resulted in great economies.

International Creosoting & Construction Company

General Office: Galveston, Texas

2IC9 The International Dating Nail

International Creosoted Yellow Pine Poles

Published weekly by Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa. Entered as second class matter, March 9, 1928, at the Post Office at East Stroudsburg, Pa., under the act of March 3, 1879.
Address communications to 30 Church St., New York City.

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York.

All communications should be addressed to the New York Office, 30 Church Street

EDWARD A. SIMMONS, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
HENRY LEE, *Vice-Pres.*
SAMUEL O. DUNN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
FREDERICK H. THOMPSON, *Vice-Pres.*
ROY V. WRIGHT, *Sec'y*
JOHN T. DEMOTT, *Treas.*

CHICAGO:
105 West Adams St.
WASHINGTON:
17th and H Streets, N. W.
CLEVELAND:
Terminal Tower
SAN FRANCISCO:
215 Market St.

Editorial Staff

SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. C. AUGUR
R. A. DOSTER
JOHN C. EMERY
MARION B. RICHARDSON
L. R. GURLEY
H. C. WILCOX
R. S. KENRICK
NEAL D. HOWARD
F. M. PATTERSON
RICHARD W. BECKMAN
LLOYD GEORGE
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
M. L. LEATH

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, $1.00; foreign countries, $2.00. Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 87 August 10, 1929 No. 6

In this Issue

North Western Expedites Trains with Centralized Control ..... Page 370

Tells of improvement in train operation which has resulted from a dispatcher—Control installation between Green Bay, Wis., and Duck Creek.

Pennsylvania Multiple-Unit Cars With Aluminum Bodies 373

A description of this equipment in the construction of which a weight reduction of 13,200 lb. per car was effected.

Cincinnati's Union Station Plan Embodies Distinctive Features 375

An outline of the general layout of this project which has been agreed upon by the railroads and approved by the city council.

EDITORIALS

Large Retirements of Equipment 367
Publicity by Motion Pictures 368
The General Foreman Helps Cut Stocks 368
Apprentice Training 369
Or Other Safety Devices 369

GENERAL ARTICLES

North Western Expedites Trains with Centralized Control 370
Trustee to Hold W. & L. E. Stock 372
Pennsylvania Multiple-Unit Cars with Aluminum Bodies 373
Cincinnati's Union Station Plan Embodies Distinctive Features 375
How the Pennsylvania Buys, by C. E. Walsh 378
Freight Car Loading 380
Soo Line Buffet-Lounge Cars 381
Rebuilding a Railroad's Operating Methods, Part II 383
Conservation of Railroad Frontage for Industry, by G. E. Fetterman 386

COMMUNICATIONS AND BOOKS 388
LOOKING BACKWARD 390
ODDS AND ENDS OF RAILROADING 391
NEWS OF THE WEEK 392

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

IT takes *courage* to be first—and *ability* to stay there. KEYSTONE was the first copper alloy steel to be produced. It is the best rust-resisting sheet steel manufactured to-day. Supplied in Black and Galvanized Sheets, Tin and Terne Plates. Demand the genuine.

AMERICAN

STEEL SHEETS *for* Every Purpose

For information write nearest District Sales Office: Chicago, Cincinnati, Denver, Detroit, New Orleans, New York, Philadelphia, Pittsburgh and St. Louis. Contributor to SHEET STEEL TRADE EXTENSION COMMITTEE.

American Sheet and Tin Plate Company

General Offices: Frick Building, PITTSBURGH, PA.

SUBSIDIARY OF

UNITED STATES STEEL CORPORATION

Quality Products *Dependable Service*

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
MINNESOTA STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL PORTLAND CEMENT COMPANY

Pacific Coast Distributors—United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*—United States Steel Products Company, New York City

Railway Age

Vol. 87, No. 6 August 10, 1929

Table of Contents Appears on Page 5 of Advertising Section

Large Retirements of Equipment

THE improvements made in the railway plant of the country by large capital expenditures during recent years have been the paramount cause of the unprecedented increases that have occurred in the efficiency and economy of operation. These improvements have consisted not merely in the making of additions to the plant, but, in very large measure, of the retirement of worn out or obsolete parts of it. The process of making both additions and retirements has affected and improved the condition of tracks, signaling and other permanent structures, as well as equipment; but the changes that have been made in equipment can be best used to illustrate the process, because more detailed information is available regarding locomotives and cars than concerning other parts of the railway plant. There are no other data available which so strikingly illustrate the changes that have occurred within recent years in railway physical properties as those relating to retirements of equipment.

The years from June 30, 1907, to December 31, 1928, are divisible into three parts of seven years each, in which conditions affecting the railways differed greatly, and in which the developments that occurred differed in ways that are highly significant. The period 1908-1914, inclusive, was one during which government regulation of railways was rapidly being made more effective, and during which the average percentage of return earned was declining. The period 1915-1921, inclusive, was that of the war and of our experiment with government operation, and was marked by a large increase of traffic, resulting in unprecedented car shortages, followed by the sharpest decline in traffic that ever occurred. In the period 1922-1928 the shop employees' strike occurred, causing sharp deterioration in the condition of equipment, but it was principally a period of physical and financial recovery, under the stimulus of the assurances of the Transportation Act, of a more friendly and intelligent public sentiment, and of co-operation extended by the shipping interests.

Remarkable Increase in Retirements

The statistics of the Interstate Commerce Commission regarding the installation and retirement of equipment include rebuilt equipment. The number of locomotives installed in service in 1928 was the smallest within the last 21 years, and the number of freight cars installed was the smallest within the last 21 years, excepting in 1920. The amount of equipment acquired since 1921 has not been, however, unusually small, considering its increased capacity per unit. In the seven years ending with 1914 the number of locomotives installed in service was 22,030, in the seven years ending with 1921 it was 11,949, and in the seven years ending with 1928 it was 14,403. The most remarkable change that has occurred has been in the number of retirements. The number of locomotives retired in the seven years ending with 1914 was 11,481. This was 22 per cent of the number in service at the beginning of this period. The number retired in the seven years ending with 1921 was only 9,866, or less than 16 per cent of the number in service at the beginning of this period. The number of locomotives retired in the seven years ending with 1928 was 19,960, or almost 31 per cent of the number in service at the beginning of this period. In the periods ending with both 1914 and 1921 installations exceeded retirements, and there were consequently increases in the total number of locomotives. On the other hand, in the period ending with 1928 the retirements largely exceeded installations, and the total number of locomotives in service declined from 64,949 at the end of 1921, to 59,391 at the end of 1928.

Prevailing Tendencies Affecting Cars

Prevailing tendencies affecting both freight cars and passenger cars have been similar. The number of freight cars installed in the seven years ending with 1914 was 911,061; in the seven years ending with 1921 only 532,194, and in the seven years ending with 1928, 861,229. In the period ending with 1914 the number of freight cars retired was 561,568, or 28.3 per cent of the number in service at the beginning of the period. The number retired in the period ending with 1921 was only 506,336, or 22 per cent of the number in service at the beginning of the period. In the period ending with 1928 the number retired was 876,561, or 37½ per cent of the total number which was in service at the beginning of the period.

The number of passenger cars installed in the seven years ending with 1914 was 21,236; in the seven years ending with 1921, 11,014, and in the seven years ending with 1928, 18,596. The number retired in the period ending with 1914 was 11,919, or 29 per cent of the total number in service at the beginning of the period. The number retired in the period ending with 1921 was 8,747, or 17 per cent of the number in service at the beginning of the period. The number retired in the period ending with 1928 was 19,683, or 36 per cent of the number in service at the beginning of the period.

The tendency rapidly to retire old and obsolete equipment still prevails. In the first half of 1929 the number

of locomotives placed in service was 811, while the number retired was 1,632. The number of freight cars placed in service was 33,497, while the number retired was 48,025.

Effect on Operating Results

The changes in the physical condition of the railways indicated by these statistics have been both the effect and the cause of important developments. As the figures show, both the installation and the retirement of equipment declined immediately before, during and following the war, when there was an unprecedented increase in the demands of traffic. This was partly due to the way in which the railways were being regulated, and partly to war conditions. The result was the large "car shortages" which were almost continuous from 1916 to 1920, inclusive. Owing to the declines in both the installation and retirement of equipment the railways were trying during these years to handle a record-breaking business with equipment and other facilities an unusually large part of which were worn out or obsolescent. Poor and inadequate service and excessive operating costs were the results. They have been able to provide relatively more new and improved facilities since 1921. Traffic has increased less rapidly than formerly and retirements have been made relatively much more rapidly, because the demands of traffic have not seemed to make it necessary to keep so much old equipment in service. The result has been that within recent years a relatively larger part of the total traffic has been handled with new equipment embodying the latest improvements than ever before, and this, together with the improvements that have been made in other facilities, mainly accounts for the remarkable success the railways have had in improving their service, and at the same time effecting reductions in their operating expenses.

The Lessons of Experience

The lessons that all this holds for regulating authorities, railway managements and the public seem to be fairly obvious. The best practicable service and the greatest practicable efficiency and economy of operation can be secured only with a railway plant that is constantly undergoing transformation through the retirement of its old and obsolete parts, and the substitution of the most modern and highly improved facilities. This constant transformation can be effected only by large expenditures of capital. When the capital can be raised, the managements of the railways should boldly raise and invest it. There is nothing more expensive than wearing out obsolete facilities. No doubt one of the reasons why so much equipment has been retired within recent years has been that it was found that it could be dispensed with because traffic had not increased as much as was expected. But the best management requires that regardless of the growth of traffic, obsolete facilities shall be retired as fast as they become obsolete if capital can be raised to replace them with modern facilities, because obsolete facilities cannot be kept in service without odversely affecting operating expenses.

Regulation should be such that the managements of the railways will be able to raise all the capital needed to make improvements in their facilities as fast as inventive genius and managerial skill suggest them. Experience demonstrates that the surest way to arrest progress in bettering railway service and effecting economies in operation is to hinder the free flow of capital into improvements in railway facilities, while the surest way to stimulate such progress is to foster the free flow of capital into the railway industry.

Publicity by Motion Pictures

A SUCCESSFUL experiment in placing a message of service before its patrons has recently been conducted by the Chicago, Rock Island & Pacific through the production and presentation of two motion pictures of that railroad's operations. These pictures are a departure from the usual in that technical subjects have been popularized, and without linking the subjects with a direct appeal for business. One film depicts the movement of perishable foodstuffs over the railroad. The other shows the construction of a new branch line, from the making of the location surveys to the operation of the first train. Each film is 1,000 ft. long, and confines its references to the Rock Island to the title plate.

Showings were made in theatres along the line as a part of the news reel, in addition to showing in high schools; theatre managers offered excellent co-operation in finding a place for the films on their programs. During the past few months one of the films has been shown to an average of about 5,000 persons per month. Considering the fact that the railroad's message was carried to each person at a cost of not more than one-third of that required to tell the same story by any other means, it offers a valuable publicity medium.

The advent of the talking picture has circumscribed somewhat the field for such a form of good-will builder but there are now and will be for a number of years many theatres which will be devoted exclusively to silent programs.

The General Foreman Helps Cut Stocks

AT the last two conventions of the International Railway General Foremen's Association, a feature was the presence and active participation of purchasing and stores department officers in the meetings. The helpfulness and constructive value of this form of co-operation can hardly be over-estimated. The sentiment in favor of closer harmony between the two departments was aptly summed up at the 1928 convention of the association referred to by a shop superintendent, who said: "Two years ago a storekeeper and a purchasing agent addressed our association. That was the first intimation I had that they were interested very much in us. I always had an idea that they were pleased when they could say that they did not have some item of material that would hold us up, and we were as pleased when we could get one on them and charge a shopping delay to lack of material. After the convention, I went home and began to see the storekeeper's job from a little different viewpoint, and I found out that he was a real fellow."

This superintendent, returning to his shop, cleaned out excess material from under benches in the erecting shop, in tool drawers and machine beds in the machine

shop, behind the bulldozer and forging machines in the blacksmith shop, and in lockers in all departments. All excess material, hoarded in anticipation of some future shortage, was returned to the storeroom and storekeepers' records, the result being that in a short time the material balance at that particular shop was practically cut in half. Another shop executive, at the convention, emphasized the value of setting up some means to let shop foremen and men know the value of all material used in car and locomotive repairs.

The consensus of mechanical officers at the convention was that the general foreman can best help reduce material balances by keeping in close touch with the stores department and taking advantage of its records as to past performances; knowing as far in advance as possible the shop schedule and policies; taking full advantage of present up-to-date methods of welding to make inactive material suitable by substitution for other uses; utilizing standard sizes and kinds of material wherever possible and thereby increasing the means of disposition in the event that the item becomes inactive; and by advising the stores department immediately in the event of any change in the program or schedule.

Apprentice Training

EXPRESSIONS of disappointment have come to us concerning the fact that the discussion of the report of the committee on apprentices at the Mechanical Division meeting at Los Angeles was so meagre, and that the report itself was limited largely to statistical data based on replies to a questionnaire. It did not include information as to more recent developments in mechanical-department apprentice training, or information in regard to extra-curricular activities which are doing much to stimulate interest on the part of the young men, broaden their viewpoints and make them more effective workers and citizens. The committee report, which summarized the replies to the questionnaire and which was accompanied by some relevant comments, certainly presented the opportunity for a good and constructive discussion.

It is unfortunate that those who were specially qualified to take part in the discussion were either absent or failed to express themselves; possibly the crowded program may have been partially responsible for this. Certainly it was not due to lack of interest on the part of a considerable number of apprentice supervisors and instructors who, if they had been present, would have liked to have participated; at any rate, a number of them have been trying for several years to bring this training question before the Mechanical Division, and the fact that it was placed on the program this year is probably largely due to their efforts.

There is, for instance, a great need for information as to how a railroad can provide the proper instruction and training for limited groups of apprentices in highly specialized crafts. The problem of building up adequate courses for such groups is an extremely troublesome one, even on the larger railroads, and there would appear to be possibilities for co-operative effort on the part of the railroads as a whole in developing courses for such crafts.

There are also wide differences of opinion as to the value of certain extra-curricular activities. Some railroads are enthusiastic over the effect of these on improved morale among the apprentices. Other managements either question their value or by their neglect of the promotion of such activities and indifference to them, apparently feel that they are not worth while.

How much does the average railroad know about the exact costs of apprenticeship training, and to what extent it is able to prove that these costs are more than offset by the benefits? Some mechanical department officers can quickly demonstrate the value of such training as compared to its costs, but can they all do so and are they sure that the training is being conducted on the most economical and efficient basis?

These are some of the questions that have been propounded to us and on which the questionnaire apparently had hoped to receive some light from the discussion at the Los Angeles meeting.

Or Other Safety Devices

THE railroads are making excellent progress in providing additional signal and interlocking protection. This is in accord with the spirit of the suggestions of the Interstate Commerce Commission, given in its order issued November 26, 1928, in which the commission relieved the carriers from further installation of automatic train control by order at that time and urged the roads to be diligent in their efforts to provide adequate protection against accidents due to grade crossings, derailments and collisions in territory not now equipped with automatic signals.

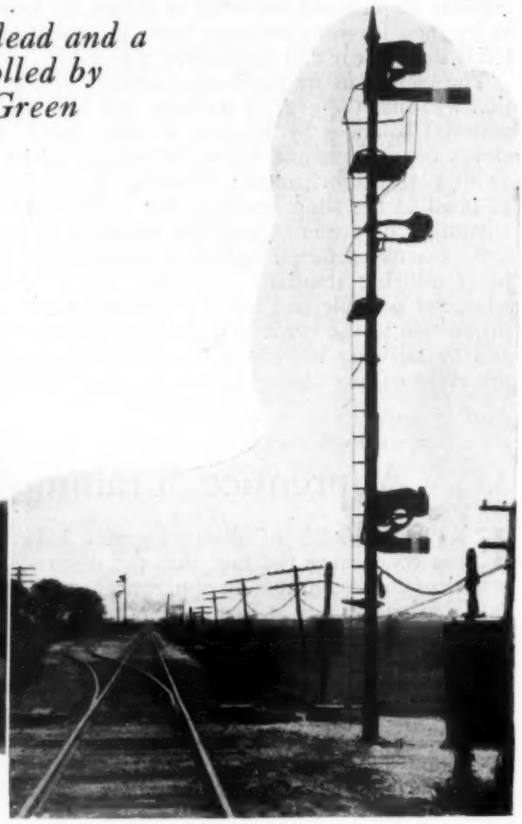
The release of this order terminated a long period of suspense on the part of the roads as to what would be required from them in the way of further train control installations, and permitted them to proceed with numerous installations of automatic signaling, interlocking, remote power switches and centralized control voluntarily. Many such installations are under way and news of the authorization of further large projects is being received almost daily. During the last two months, for example, reports have been published of materials having been ordered for automatic block signaling on over 1,500 miles of road, for 12 interlocking plants involving 413 levers, and for 2 centralized control installations and numerous smaller remote control switch installations. Manufacturers are now having difficulty in filling orders for signaling materials promptly, and skilled signalmen are scarce. Such activity certainly meets the suggestions if it does not exceed the hopes of the commission, and at the same time permits economies to be made in the operation of trains, as well as increasing the capacity of existing track facilities.

In the meantime, train control is in full service on 20,121 miles of track with 9,875 locomotives equipped. Maintenance methods are being raised to a level of reliability almost equal to that attained with automatic block signaling. The carriers are recognizing the benefits of the systems, especially the cab signaling features. It may therefore, be said that the evident purpose of the orders of the commission is being accomplished in that automatic train control has been developed to a state of practical operating efficiency on a large scale, and, at the same time, the carriers are proceeding to install signaling facilities extensively, which is not only resulting in greater safety, as desired by the commission as well as the carriers, but is also effecting economies in operation. In other words, all is well in the signaling and train control field today.

North Western Expedites Trains with Centralized Control

Junction switch, yard lead and a crossover are controlled by the dispatcher at Green Bay, Wis.

Control Machine Located Where the Dispatcher Can Handle It Conveniently



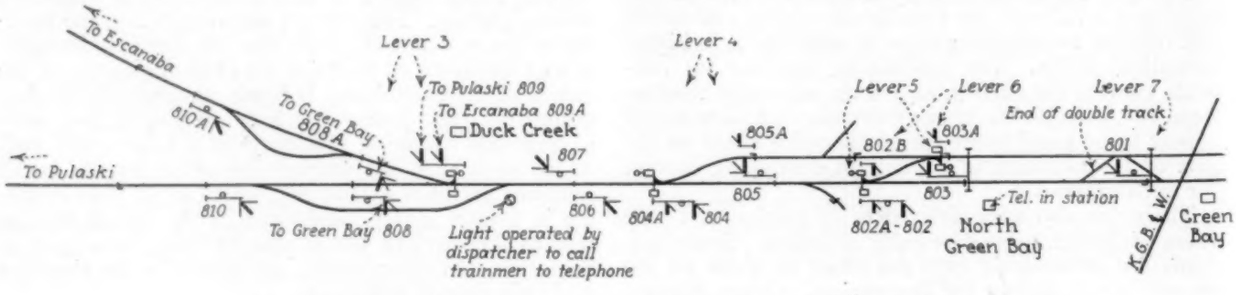
Signal 804, Power Switch Machine in the Background

A NOTICEABLE improvement in train operation has resulted from a dispatcher-control installation on the Chicago & North Western between Green Bay, Wis., and Duck Creek, approximately four miles. At the latter location, where the Lake Shore and the Peninsula divisions diverge, there was formerly a four-lever mechanical interlocking plant, employing one combination leverman and operator on each trick. These men have been released and in addition the train dispatcher estimates that there has been a saving in running time of at least 15 min. per freight train between Duck Creek and Green Bay, by reason of the elimination of stops in entering and leaving the North Green Bay freight yard. In addition, there has been a large but undetermined saving in train time because of the elimination, within these limits, of the superiority of trains according to class and direction, and the movement of all trains entirely by signal indication.

Traffic Heavy

The traffic approximates 32 trains daily, including 9 passenger trains and 6 freight trains scheduled regularly in each direction, in addition to one or two extra freight trains daily. It is evident, therefore, that this short section of single-track railroad is a particularly busy line. All of the switch machines, signals, control relays and the control machine on this installation were furnished by the General Railway Signal Company.

No derails are required in this layout. The four



Track and Signal Plan Showing Layout From Duck Creek to Green Bay

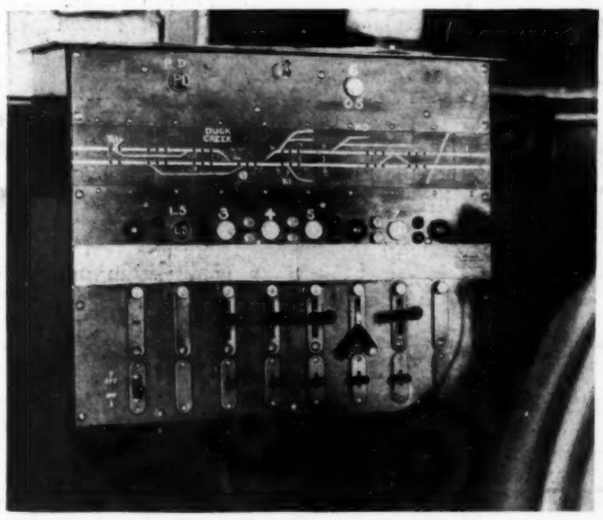
switches are operated by power switch machines equipped with dual-control selectors, the latter mechanism permitting the train crew to throw the switch manually in case of a failure of the switch machine or when switching, provided permission is obtained from the dispatcher. If the dispatcher should mistake the identity of a train, line up the wrong route for it, and display clear signals, the electric locking can be released so that the route can be changed by instructing a trainman to operate the dual-selector lever to the vertical or mid position, and return it to its normal position. Each switch machine is operated from a 10-cell Exide storage battery.

Signals Are Semaphore Type

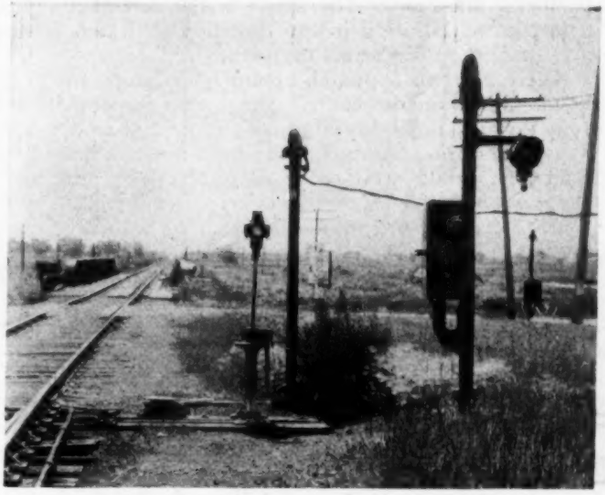
The signals are semaphore type, the southbound signals at Duck Creek operating from 0 to 90 deg. in the upper quadrant. The northbound home signal at Duck Creek, however, operates only from 0 to 45 deg., because there are no automatic signals northbound after leaving Duck Creek. It was not necessary to change the southbound home signals at Duck Creek, because these were formerly power-operated signals, controlled from tail-levers in the mechanical machine. It was, however, necessary to replace the northbound home signal, which was a mechanically operated signal.

The home signals, *804* to *802*, for southbound trains, which are located to the west of the yard connections, govern movements on the main track by display of the top arm, and movements to the yard by display of the low-speed arm for the diverging movement to a secondary track, which can only be made at slow speed.

It should also be noted from the track plan that Signals *805* and *803*, governing westbound movements on the main line, are located 500 ft. east of the switches, this arrangement being made so as to enable the dispatcher to advance westbound trains on the main line to one of these signals, thus permitting a simultaneous eastbound movement of a freight train into the yard lead. This arrangement of signaling has been found to save much time. If the dispatcher should desire to move a westbound freight train out of the yard lead at the crossover switch at North Green Bay, he clears the dwarf signal, *803A*, and as eastbound freight trains normally enter the yard at the switch about one mile west of North Green Bay, it is thus possible for a westbound train to pull out of the yard at the same time that an eastbound train is entering the yard lead. Signals *803A* and *805A* are controlled by the regular A. P. B. single-track circuits in the same manner as the high signals.



Close-up View of the Control Machine



The Telephone Signal

All of the signals, with the exception of Signal *801*, which is the westbound entering signal to the dispatcher-controlled territory, are controlled automatically by the position of the switch and the direction of traffic. Signal *801*, however, is controlled by a separate lever in the dispatcher's machine. This signal is located on the signal bridge at the west end of the short double-track section running through the city of Green Bay. It permits the dispatcher to advance trains as far as the crossover at Signal *803*, thereby clearing the K. G. B. & W. crossing just east of Signal *801*. The track section between these two signals serves to control the "OS" lamp mounted above Lever 7, which is the lever controlling the entrance Signal *801*.

Dispatcher's Control Machine

The G-R-S dispatcher-control machine has five working levers and is located in the dispatcher's office in the Green Bay station. The machine is within easy reach of the dispatcher when he is seated at his desk handling train movements by telegraph on other parts of the division. Levers 3, 4 and 5 control the four power-operated switches, Lever 3 controlling the junction switch at Duck Creek, Lever 4 the west lead to the yard, and Lever 5, both ends of the crossover. Lever 6 controls the two dwarf signals on the yard track at the crossover, one dwarf (*803A*) being for westbound movements over the switch, and the other dwarf (*802B*) for eastbound trains on the yard lead. It was necessary to have a separate signal control lever for these two dwarf signals in order to permit uninterrupted switching movements over the yard end of the crossover switch. Lever 7 controls the northbound Signal *801*.

A white switchboard lamp or bull's eye, located above each switch control lever, provides two indications. Whenever a train occupies the track section in which the switch is located, this lamp is lighted. Also, whenever the switch is operated from normal to reverse, or vice versa, two distinct flashes of the lamp occur, one flash at the moment that the switch starts to operate and the second flash at the instant when the switch movement is completed. The flashing of the lamp is accompanied by an audible bell signal to attract the dis-

patcher's attention. The small traffic direction lights have arrows pointing in the direction in which routes are established for trains to operate.

There are two approach annunciator lamps for eastbound trains on the control panel, one for the Peninsula division and, the other, the Lake Shore division. Westbound movements for the yard are announced by telephone while westbound movements on the main track are scheduled movements arranged for by the dispatcher. A feature of the dispatcher's machine is the special annunciator relay located on the relay panel at the base of the machine. This special polarized relay is controlled by a single wire from Duck Creek, and provides an indication of an approaching train on either the Peninsula or Lake Shore division.

Beneath each major control lever of the machine is a small telephone type key which can be moved up or down. When one of these keys below a switch lever is thrown upward, the signals at that location are stick controlled; that is to say, the home signal will remain at stop after the train passes through the dispatcher-controlled territory. Also the "OSing" feature of the lamp is continued indefinitely until the dispatcher releases the key, this feature being used whenever the dispatcher is called away from his desk and serving to remind him of what has taken place during his absence. When one of these keys is thrown down, the audible bell signal is cut out, which is desirable whenever the maintainer is making a test.

Telephone Call Signal

At each switch location, a magneto telephone is provided so that train crews can communicate with the dispatcher. These telephones are all on a multiple circuit, and in order to improve the quality of the telephone service, a special cut-out switch is incorporated in each telephone cabinet, such that, when the door is closed, the telephone is disconnected from the line.

It will be noted on the track plan that a special light signal, operated by the dispatcher, is located at the east end of the Duck Creek passing track. This signal comprises a highway crossing lamp mounted on a bracket arm and a cable post. This signal has a 10-volt, 10-watt lamp with a red lens, and burns continuously whenever the train dispatcher operates the key at the lower left corner of the control panel. When this signal is displayed, it indicates to a freight train on the passing siding, or to any eastbound train approaching the junction, that the dispatcher wishes to communicate with the train crew by telephone. In other words, it calls the train crew to the telephone, so that the dispatcher can secure any information he may desire, and it gives him just as much contact with the train crew as was possible when the telegraph operator was stationed at Duck Creek.

The control of this "phone" signal is rather ingenious. A Western Electric polarized telephone relay of 2,500-ohms resistance, in series with two additional 2,500-ohm resistance units, is connected across the telephone wires. A 90-volt radio B battery is connected to the telephone wires through normally open polarized contacts of the control key on the machine. Operation of the control key impresses 90 volt across the telephone wires momentarily to kick over the polarized telephone relay from the "off" to the "on" position or vice versa. The extremely high resistance is necessary in order to prevent the operation of this relay whenever a telephone magneto is operated at any of the telephones, because these magnetos are in multiple with this control circuit. A small step-down transformer, without a storage battery reserve, supplies the 10-volt lamp for the signal.

Trustee to Hold W. & L.E. Stock

WASHINGTON, D. C.

TRANSFER to a trustee of Wheeling & Lake Erie stock now owned by the Van Sweringen interests through the New York, Chicago & St. Louis and the Allegheny Corporation, has been approved by the Interstate Commerce Commission in a report and order made public on August 1. E. R. Fancher, governor of the Federal Reserve Bank of Cleveland, is named as trustee with authority to vote the Wheeling shares provided they be not voted in approval of acquisition of the Wheeling by the Nickel Plate, the Baltimore & Ohio or the New York Central, unless such a vote of approval is authorized by the commission or required by a court order.

This action in approval of the trusteeship is an aftermath of proceedings under the Clayton anti-trust act, brought by the commission, against the B. & O., the New York Central and the Nickel Plate requiring these carriers to show cause why their acquisition of Wheeling stock were not acts in restraint of trade. In a decision, dated March 11, the commission found the holdings to be in violation of the Clayton act and issued an order requiring the defendant carriers to divest themselves of such holdings.

In subsequent answers, the New York Central and the B. & O. stated that they had sold to the Alleghany Corporation all their Wheeling stock and thus requested that the order for divestiture be set aside. The Nickel Plate next filed an application for the approval by the commission of its Wheeling stock holdings and also of the purchase by the Nickel Plate of the Wheeling stock acquired by the Alleghany Corporation from the B. & O. and the New York Central.

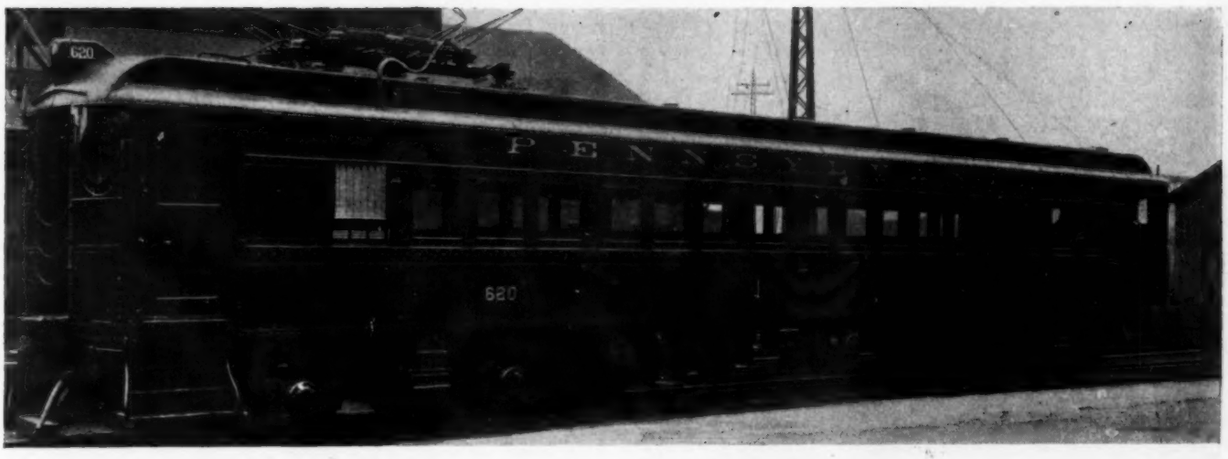
Pending action on the B. & O. and New York Central answers to the divestiture order, the Nickel Plate application and the pending application of the Chesapeake & Ohio for authority to acquire both the Nickel Plate and the Wheeling, representatives of the Nickel Plate and of the Alleghany Corporation discussed informally with the commission a plan which might be acceptable as a compliance with the divestiture orders.

Following such discussions the Nickel Plate presented a petition to intervene in the anti-trust cases in which the B. & O. and the New York Central were defendants on the ground that it had the agreement with the Alleghany to purchase the stock acquired by the latter from those defendants. The Nickel Plate then petitioned for supplemental orders in these foregoing cases to approve the trust agreement.

Sales of the trusteed Wheeling stock are to be authorized subject to the approval of the commission. The trust is to be terminated: (a) By approval of the commission of the Nickel Plate application for acquisition of the stock involved; (b) By approval of the C. & O. application to acquire the Nickel Plate and the Wheeling: (c) By sale of the stock. There is a further provision that the stock must be sold within one year afterward if the commission decides that the Nickel Plate and C. & O. application should be denied.

In view of the commission's approval of the application, Attorney General William D. Mitchell relieved the companies involved from their commitments, to the Department of Justice, against the voting of the stock to the extent that may be necessary to permit the trustee, as proxy, to exercise voting rights.

The approval of the trusteeship constitutes full compliance with the orders of divestiture but is without prejudice to further jurisdiction by the commission.



A Pennsylvania Multiple-Unit Electric Car Equipped with an Aluminum Superstructure and Roller Bearings

Pennsylvania Multiple-Unit Cars with Aluminum Bodies

Weight reduction of 13,200 lb. per car effected—New bodies made according to original drawings

THE greater part of the Pennsylvania System's main line suburban traffic between Philadelphia, Pa., and Paoli is carried in M. P. 54-E multiple-unit electric cars of steel construction. During 1926, eight of these cars were built at the Altoona shops employing aluminum alloy superstructures, except for the belt rails which were made of steel. The total weight of the original cars was 124,450 lb.; the weight of the rebuilt cars, 111,250 lb., or a weight reduction of 13,200 lb. per car.

The new bodies were made according to the original drawings. The cross-sectional areas, the size and thickness of the aluminum parts correspond exactly with those of the original steel parts and no new dies or presses were required for the fabrication of the aluminum parts.

Since welding was not used, the parts were joined with ¾-in. steel rivets, the minimum spacing of which was 1½ in. Because of the use of rivets, splice plates were used in the roof, letter-board and window-head joints. The roof splice plate was assembled with a single ply of tar paper covered with a thick coat of paint to prevent corrosion.

When the cars were ready for painting, the aluminum parts were sand blasted and then wire brushed, after which they were washed with turpentine and then sponged down with a dilute ammonia solution made up of three parts of ammonia and 97 parts of water by volume. This preliminary treatment of the surface was necessary to prevent the priming coat from blistering. The cars were then painted in the same manner as steel equipment.

To understand better how this reduction of weight was made possible without any appreciable change in the strength of the superstructure, a brief description of the various aluminum alloys used is necessary.

Table I lists the various parts of the car body together with the type of aluminum alloy used as furnished by the Aluminum Company of America.

The end sheets, the window head, the ceiling sheets, the mouldings and the saloon sheets were made of 2S aluminum, which is commercially pure and has a low tensile strength. It will be noticed from Table I that

Table I—Aluminum Parts Used in Pennsylvania M. P. 54-E Multiple Unit Cars

Part	Thickness	Aluminum used
Side plate	1/8 in.	17ST
Side post	1/8 in.	17S hot pressed
Window bracket	195	HT Casting
End sheet	1/16 in.	2S ¾ hard
Window sill	1/8 in.	17S hot pressed
Window head	1/8 in.	2S ¾ hard
Letter board	1/8 in.	3S hard
Side eave	1/8 in.	17S hot pressed
Deck plate	1/8 in.	17S hot pressed
Reinforcement for seat support.	3/8 in.	17ST
Floor-support angle	.....	17ST
Ceiling-rail angle	.....	17ST
Window post	1/16 in.	17S hot pressed
Roof carlin	.110 in.	17S hot pressed
End-door head	1/8 in.	17S hot pressed
Side post at saloon	1/8 in.	17S hot pressed
Lower-deck roof sheet	1/16 in.	17ST
Upper-deck roof sheet	.090 in.	17ST
Roof tees	.....	17ST
Ceiling sheets	1/16 in.	2S ¾ hard
Mouldings	1/32 in.	2S ½ hard
Saloon sheets	1/16 in.	2S ¾ hard
Vestibule end sheets	.110 in.	17ST
Vestibule corner post	1/8 in.	17S hot pressed
Vestibule diaphragm attachment	1/8 in.	17S hot pressed
Deck-plate and post stiffener	.....	195 HT casting
Door facing	.050 in.	2S ½ hard
Saloon door, End door	.....	17S frame; 3S ½ hard sheet
Switch-board doors	.....	3S ½ hard
Lamp fixtures	.090 in.	3S annealed
Pantaograph support angle	.....	17ST
Steps	.....	17ST
Ventilators	.090 in.	3S ½ hard
Headlight	.090 in.	17S annealed

Aluminum Car Body Ready for the Paint Shop

after each of the above-mentioned parts appears the term, hard, three-quarters hard or one-half hard, which indicates the degree of strain-hardening to which the metal is subjected by cold working under the presses. The standard tempers, so called, and approximate property ranges of 2S aluminum are listed in Table II, which shows the minimum tensile strength of hard 2S aluminum to be 22,000 lb. per square in.

The letter board, the saloon and switch-board doors, and the lamp fixtures are made from 3S aluminum alloy of varying degrees of hardness. This alloy contains approximately 1.25 per cent magnesium, which

Table II—Standard Tempers and Approximate Property Ranges of 2S Aluminum

Temper	Tensile strength, lb. per sq. in.	Elongation * Percentage in 2 in.
Soft	12,000 to 16,000	30 to 45
¼ hard	14,000 to 18,000	5 to 10
½ hard	16,000 to 20,000	3 to 7
¾ hard	19,000 to 23,000	1 to 4
Hard	22,000 (minimum)	1 to 4

* Tests on sheet in Brown & Sharpe gages 10 to 28, were made on the test specimen recently adopted by the American Society for Testing Materials.

has practically no effect on its corrosion resistance. In this alloy, as in the 2S type, the different tempers are produced by cold working the metal after annealing. Thus, the degree of hardness of the above-mentioned parts made from the 2S and 3S materials was obtained

Table III—Mechanical Properties of 3S Aluminum Magnesium Alloy (1.25 per cent magnesium)

Temper	Tensile strength, lb. per sq. in.	Elongation Percentage in 2 in.
Soft	15,000 to 18,000	15 to 30
¼ hard	18,000 to 22,000	5 to 8
½ hard	20,000 to 24,000	2 to 6
¾ hard	24,000 to 29,000	1 to 4
Hard	27,000 (minimum)	1 to 4

by the amount of cold working after they were annealed in special furnaces built at the Altoona shops. The mechanical properties of 3S aluminum alloy are shown in Table III.

As will be noted from Table I, many of the car parts were made from special 17 ST or 17S high-strength aluminum alloys which contains approximately 4 per cent copper, 5 percent manganese and 5 percent magnesium. This alloy has a tensile strength range from 63,000 to 70,000 lb. per square in. and a yield point range from 50,000 to 55,000 lb. per sq. in. The percentage of elongation in 2 in. is between 8 to 14. It will be noticed from Table I that the parts made from the 17S alloy were hot pressed. The forming temperature of these parts, which were made in the Altoona shops, was in the range of the heat-treating temperature. The cooling in the dies served as an effective quench. Thus, the forming and heating were accomplished in the same operation, with the result that there was no warping or twisting of the material.

The window brackets, the deck plate and the post stiffeners were cast from 195 HT aluminum alloy, which contains 4 per cent copper. The ultimate tensile strength range of these casting is from 36,000 to 50,000 lb. per sq. in., with an approximate yield point of 27,000 lb. per sq. in.

The foregoing brief description of the aluminum alloys used in these cars indicates that the selection of

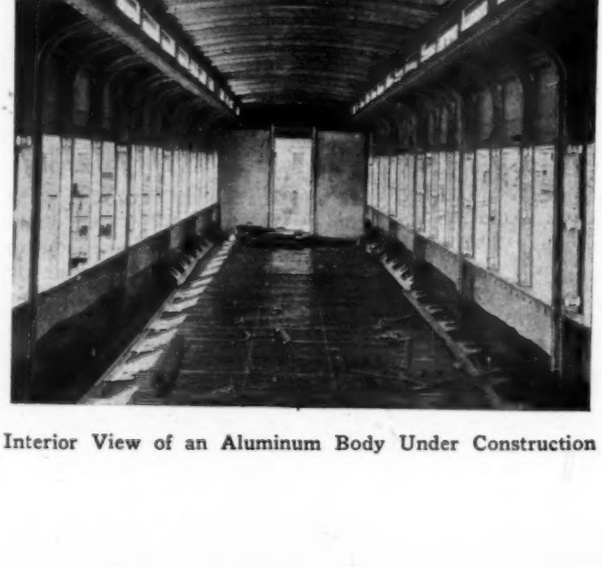
Table IV—A Summary of the Average Results for Each Test Period

Material	Age	Tensile strength, lb. per sq. in.	Elongation, per cent 2 in.	Brinell hardness	Ratio of tensile strength to Brinell hardness
17 ST	Initial	61,320	21	98	625
	6 mo.	60,660	19	104	585
	1 yr.	61,040	20	103	594
	18 mo.	61,790	21	101	609
	2 yr.	61,340	18	99	623
17 SH	Initial	56,590	14	90	629
	6 mo.	56,370	15	94	600
	1 yr.	56,800	16	94	608
	18 mo.	58,020	17	93	625
	2 yr.	57,380	16	91	630

the alloy for each of the different parts of the superstructure was determined by the amount of stress which each part had to withstand.

Two Years' Test of Material Used

A two-year test was conducted by the test department of the Pennsylvania to determine whether any changes would take place in the physical characteristics of the aluminum alloys used, as the result of aging. At six month intervals for a period of two years, test specimens were examined and the data obtained compared with that of the test specimens taken when the alloys were first placed in the cars in 1926. A study of the data given in Table IV shows that the physical properties are practically the same as at the beginning of the test.



Interior View of an Aluminum Body Under Construction

Cincinnati's Union Station Plan Embodies Distinctive Features

General layout has been agreed upon by the railroads and approved by the city council

THE last obstacle to the construction of the new $40,000,000 union station at Cincinnati, Ohio, was removed on July 17 when the Cincinnati City Council passed ordinances covering the vacation of streets, in the terminal area, the granting of the right to cross certain streets with superstructures and permission to erect and maintain certain other overhead structures. The terminal plan, which embraces not only a passenger station, but also an engine terminal, a coach servicing yard, and express and mail terminals, will provide complete passenger terminal facilities for all the railroads entering the city and entirely supplant the four different stations now operated by these railways in Cincinnati.

The new station will have an immediate daily capacity of 105 trains inbound and as many outbound, with provision for a considerable increase in capacity whenever growth of traffic demands. The project will cover operations over an area of 320 acres, and involve the construction of 94 miles of new tracks, the moving of 54 miles of existing tracks; and the placing of 5,500,000 cu. yd. of embankment, 160,000 cu. yd. of concrete, 400,000 lin. ft. of concrete piling and 22,000 tons of structural steel, inclusive of that required in building construction. As described in the *Railway Age* of February 18, 1928, page 409, this project will be carried out through the agency of the Cincinnati Union Terminal Company, a corporation whose stock is held by the participating railroads, namely, the Baltimore & Ohio; the Chesapeake & Ohio; the Cleveland, Cincinnati, Chicago & St. Louis; the Louisville & Nashville; the Norfolk & Western; the Pennsylvania; and the Cincinnati, New Orleans & Texas Pacific (Southern).

Main Features of Plan Agreed Upon

As outlined in the article mentioned above, the railroads had at that time definitely agreed upon the location for the new station. They have since perfected agreements covering the vacation of existing railway facilities on this site, the primary features of the plans for the station and the auxiliary facilities, as well as the arrangements for the various rail routes to the site. All of the roads except two, the Pennsylvania and the Norfolk & Western, will make direct contact with the terminal property over their own rails or routes involving trackage rights of long standing, and these two have now concluded agreements for entrance over the lines of one of the associated railways in the project.

The chosen site, which is the only one affording adequate space that is so located as to offer convenient access for the participating railways, is a strip of land extending for a distance of about two miles along the east side of Mill Creek, from a point near its confluence with the Ohio river. The station headhouse will be about a mile and a half west of the business center of the city. The terminal tracks will occupy an average width of about 800 ft., but owing to necessity for replacing railway facilities that must be removed to make way for the new terminal, actual construction operations will cover an average width of 1,600 ft. throughout the two miles. Of the total area to be used, the station proper will occupy the portion nearest the river, with the axis of the station about ¾ mile from the river bank.

Station Will Be of the Through Type

While Cincinnati is a terminal for all lines entering the city, with the exception of the line of the Baltimore & Ohio between St. Louis and the Atlantic seaboard, the station will be of the through type. This is for the reason that trains will enter the terminal area both from the north and the south.

Five lines will enter from the south. The Southern will make direct contact from the end of its bridge across the Ohio river. The Chesapeake & Ohio and the Louisville & Nashville will have access over the tracks of a terminal railway extending from the north end of the Chesapeake & Ohio's bridge, while a connection to the west from Storrs station will be provided for the St. Louis line of the Baltimore & Ohio and the Chicago line of the Big Four. A direct connection will be made at the north end of the terminal property with the B. & O. line to the east and will serve as the entrance for that road from the north and east, the Ohio lines of the Big Four and also as the entrance for the Pennsylvania and the Norfolk & Western, which will use the B. & O. tracks from a point near Norwood. The Chesapeake & Ohio of Indiana will enter the terminal area near the center of the layout by means of a viaduct across the Mill Creek valley from the west.

The station will be of the two-level type, with the station floor 22 ft. above the tracks and conforming in a general way to the oft-used plan embodying a concourse spanning over the tracks and platforms on the transverse axis of the layout. Except for this, however, there is little about the plan that conforms in detail to any other existing passenger terminal, for, in many ways, the plan is essentially unique. In no other station does the plan provide for as complete a segregation of incoming and outgoing passengers, as direct a means of access for all forms of street transportation and such a thorough elimination of interference of one mode of street transportation with another. Private automobiles, street cars, motor coaches, taxicabs and baggage trucks will enter and leave the station without occasion for any cross movements with any other class of vehicles.

Will Have An Impressive Setting

But what is equally noteworthy is the setting of the station from the standpoint of esthetics. Although the site selected for the station is one of drab surroundings, special pains were taken to seize upon the one oppor-

tunity which the site afforded for the development of an impressive setting. The axis of the station was made to conform to the east and west center line of Lincoln Park, a public park 500 ft. wide by 700 ft. long, located about 500 ft. east of the east or street front of the station headhouse. Therefore, by purchasing the land lying between this park and the station, the terminal company is enabled virtually to extend this park to the station door, and the studies now being prepared by the City of Cincinnati for the co-ordination of the plan of the parkway approach with the plans for the station itself give assurance of a remarkably pleasing and attractive layout.

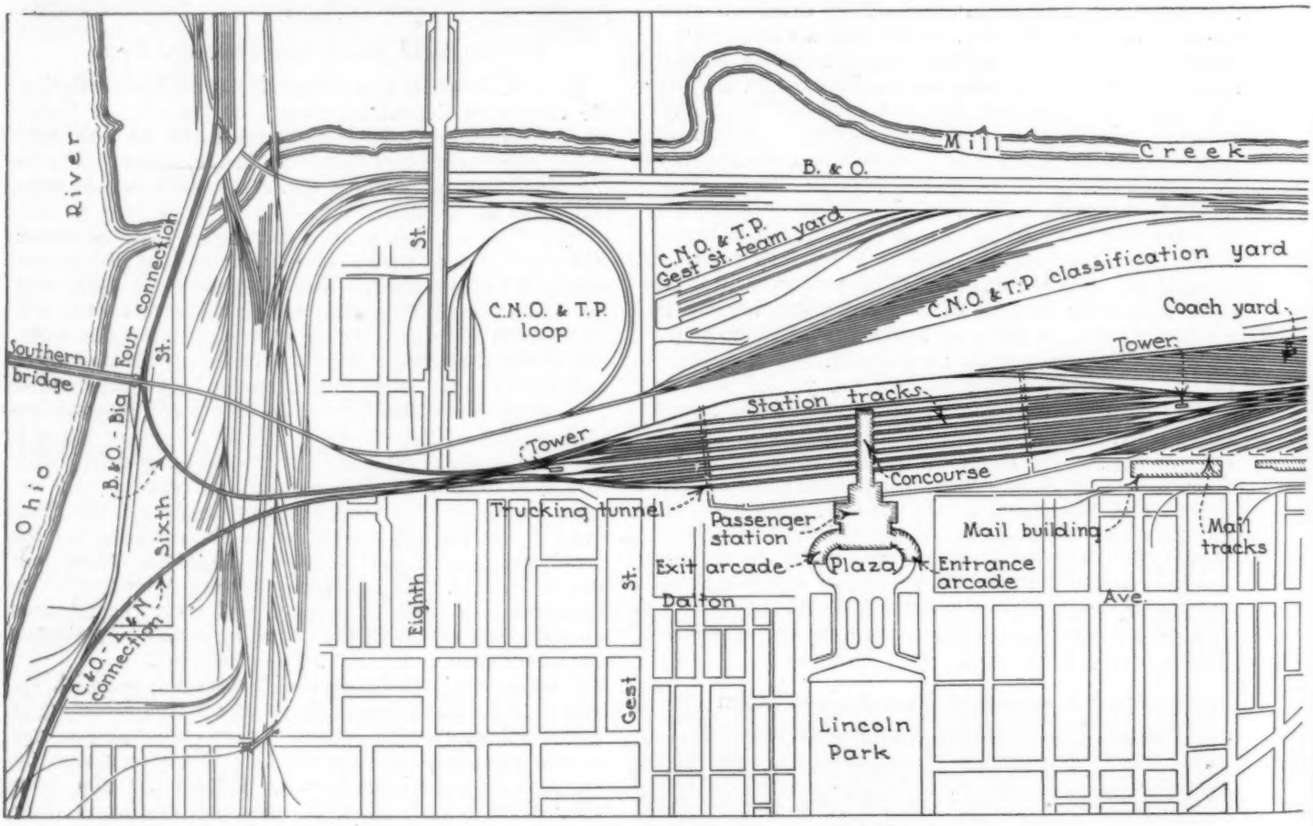
This approach parkway will be graded to provide a gradual slope rising from the east so that the plaza in front of the station will be about 35 ft. higher than the adjoining streets. This will naturally focus attention on the station building, of which the main feature will be a central mass having an eastern elevation in the form of a great semi-circular arch flanked by curved arcades which will serve as the principal entrances and exits for the station.

Approaching the station from the east through the parkway, there will be two broad drives for eastbound and westbound traffic, respectively. Private automobiles approaching the station on the north or westbound drive will turn into the plaza at the east front of the station to pick up or leave passengers. Taxicabs and motor coaches using the north drive will turn to the right on approaching the station so as to reach the entrance to the north arcade. Here they will be joined by street cars which will approach the station on a track occupying the street flanking the north side of the parkway.

The arcade will serve as a shelter for landing platforms for passengers using any form of public street vehicles in entering or leaving the station. These landing platforms will divide the traffic into three lanes, one each for street cars, motor coaches and taxicabs. Near the outer end of the arcade both platforms and roadways will be at an elevation considerably below the station floor level, but approaching the central body of the station, the grades of the platforms and roadways will separate, the platforms serving as ascending ramps to the station floor level and the roadways descending, so that street cars, coaches and taxicabs, after unloading passengers in the north arcade, may pass under the station concourse and emerge in the south arcade to receive passengers leaving the station.

On ascending the ramp the passenger will enter a central concourse, approximately semi-circular in plan, 170 ft. wide north and south by 140 ft. deep east and west, with a great half-dome ceiling rising to a height of 110 ft. above the floor and lighted by windows of large area which will occupy the wall space under the massive arch that forms the principal feature of the east elevation.

On the west side of this concourse a large arched opening will afford direct access to a second concourse, 580 ft. long by 80 ft. wide with a barrel-vault ceiling. This will be built over the station tracks and will serve both as a general waiting room and as a train concourse, with doors in the north and south walls connecting with stairways and ramps that will lead to and from the train platforms. The auxiliary service facilities will be accommodated on either side of the large entrance concourse, and since the incoming and outgoing passengers will be largely segregated—outbound passengers on the



Map of the South End of the Terminal Development Showing Connections and Station Layout

north and inbound passengers on the south—particular pains will be taken to provide on the north side those facilities used by the outbound passengers, i.e., the ticket office and baggage checking counter, and on the south, those facilities used by passengers arriving from trains either to enter the city or change trains, namely the parcel check room, restaurants, toilet rooms, etc.

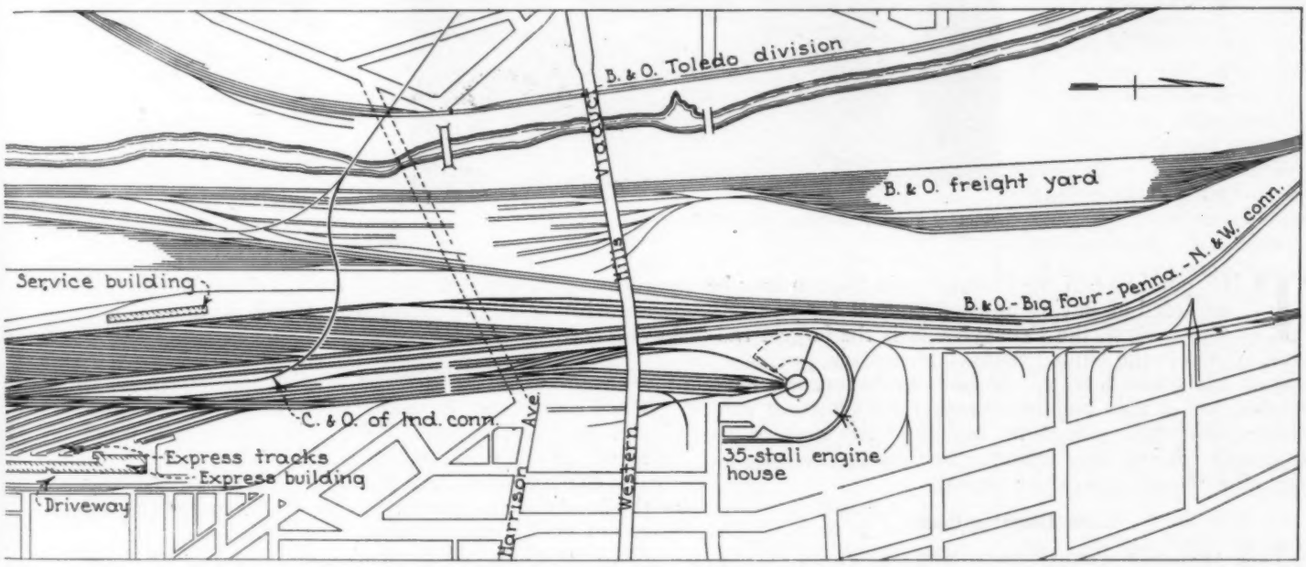
Facilities for Baggage, Mail and Express

Baggage, mail and express will be moved to and from the track platforms via elevators at each end of the platforms connecting with tunnels under the tracks, that will have their portals east of the tracks where they will connect with a north and south runway. This will not only pass under the station for access to the baggage room but will also be extended northward to reach the mail and express buildings to be built with frontage on low-level streets north of the station building. Street

press buildings and a complete engine-terminal layout with a 35-stall roundhouse.

Heavy Construction Involved

At present the site of the station and the proposed parkway is occupied by a classification yard and local freight terminal of the Southern. Consequently, the successful outcome of the plan to use this site was contingent on suitable provision for these facilities on another site. Fortunately, there is a large area of low, largely unoccupied land between the Southern's yards and Mill Creek, so the plan provides for the construction of a complete new terminal for that road to the west of the property acquired for the passenger terminal layout. It will also be necessary to provide certain facilities for three of the other roads for the same reason. As much of the area to be used for these various improvements is low and it was imperative that the



The Engine Terminal and Coach Yard Occupy the Northern Portion of the Terminal Area

vehicles handling baggage, mail and express will be afforded direct connection with tail-board space at the level of these facilities without interference with street vehicles handling the passengers.

Space for Future Expansion

In the initial construction, the station will have 14 tracks, arranged in pairs to serve 7 platforms, 1,600 ft. long which will provide adequate space for handling a maximum of 35 trains in one hour. Space has been provided, however for the future addition for 8 more tracks. Space between the ends of four of the platforms and the two throats of the station track layout will be utilized for the construction of stub tracks for the parking of locomotives, diners, sleepers, etc. The three southern connections with the terminal will diverge directly south of the south throat of the station yard, but to the north and the main line approach will extend along the terminal company's property for nearly a mile. This main line will be located along the west side of the layout so that the trackage for auxiliary facilities may be placed on the east or city side. These include a large coach yard with a service building having street frontage, tracks for mail and express cars with platforms communicating with the mail and ex-

tracks be placed at an elevation well above recorded high water in the valley, the entire track area will be raised an average of 12 to 15 ft., with a maximum raise of 20 ft. This will entail the placing of 5,500,000 cu. yd. of filling.

The terminal area lies across the lines of communication between the business center of Cincinnati and that part of the city which lies to the west of Mill Creek, and while the physical features of the valley are such as to make street construction difficult, a number of important heavily-traveled east and west streets cross the valley within the limits of the proposed terminal area. Some of these cross the existing tracks at grade, but for the most part, viaducts provide for the separation of grades. However, in most cases, these improvements do not meet the needs of the terminal project, and it will be necessary to make large expenditures for both street subways and viaducts in carrying out the terminal project.

H. A. Worcester, vice-president of the Big Four is president of the terminal company. The plans are being developed under the direction of Col. Henry M. Waite, chief engineer, who will also have direct charge of construction. Felheimer & Wagner, of New York, are architects for the station building.

How the Pennsylvania Buys

Spends over hundred million yearly for supplies—Operations concentrated and standardized to secure economy

Waiting Room, Pennsylvania Purchasing Department

By C. E. Walsh
Purchasing Agent,
Pennsylvania*

THE purchases of the Pennsylvania System may be regarded as having unusual interest for two reasons. First, the Pennsylvania is the largest railroad system in the United States. Hence, our purchases are on the greatest scale. Second, we believe we have worked out a plan and organization for effecting purchases which have placed this branch of our work on an unusually efficient basis from the viewpoint of economical and effective use of working capital.

Low Buying Cost

Last year the Pennsylvania System, in its largest aspect, which includes the Long Island, purchased materials, supplies and locomotive fuel to the extent of $132,000,000. This sum, when the figures for the entire country are brought in, will probably represent about ten per cent of the total. Eliminating the Long Island and a few of the smaller companies which we control but do not directly operate, the purchases of the Pennsylvania and its directly operated lines were $127,000,000. This represents somewhat less than the average of recent years and is a reflection of the rigid scrutiny being given to every form of expenditure by the management. We in the purchasing department also believe it is a direct result of the system of concentrated buying which has been developed. As a result of this system and organization, the total cost of operating the purchasing department represents less than 60 cents of every $100 worth of purchases, which is a very low buying cost.

Headquarters' Staff, Pennsylvania Purchasing Department—C. E. Walsh in Center

Many Companies to Buy For

The Pennsylvania System consists of nearly one hundred active corporations. The Pennsylvania Railroad owns all, or practically all, the capital stock of many of these. With others, there is a large interest outstanding in the hands of the public. Some of the properties are leased to the parent company. Others are not.

All of these separate companies, however, for legal and other reasons, including the protection of bond and other security holders, must maintain their individual corporate existence. That involves the purchase and ownership by the separate companies of definite property of various kinds, not only real estate, but also that which is currently used and consumed in carrying on the business, such as fuel, materials and supplies.

Moreover, the rail lines and facilities embraced in the Pennsylvania System are divided into four main territorial subdivisions. These are known respectively as the Eastern, Central and Western regions, and the New York zone. Their boundaries and the extent of territory which they respectively cover have no relation at all to questions of the corporate ownership, but have been fixed solely from the viewpoint of convenience and efficiency in physical operation.

* From an address to the National Association of Sheet Metal Contractors.

In organizing and conducting the purchasing work of the Pennsylvania System, therefore, we have two distinct considerations in mind. All questions of separate ownership of property and the allocation of the cost of acquiring it must be strictly observed, in accordance with the corporate structure of the system. We must also be guided by the needs and requirements of those administrative officers and subordinates in charge of the operating subdivisions.

Purchasing Re-organized

In former years the purchasing work of the Pennsylvania System was carried on under an organization, and by methods which were more or less of a compromise between the principles involved in the intricate corporate structure of the system and those inherent in its territorial subdivisions for operating purposes. Since the termination, in 1920, of the Federal Control period, during which the railroads were temporarily in the hands of the government for war purposes, the management of the Pennsylvania System has centered its efforts largely upon methods of introducing greater efficiency and economy in every branch of the work, devising short cuts, eliminating duplications, and standardizing practices as far as possible. In the purchasing department, we came to the conclusion quite a few years ago that, notwithstanding the complications in our corporate structure and the necessity for territorial subdivisions of the lines for operating purposes, it would be possible to conduct all of the purchasing work in a single department, directed by one head. That plan, under which we are now working, has been in effect since 1924.

We buy the materials and supplies, including locomotive fuel, for nearly 100 transportation and other companies, just as if they were merged into one single corporation. We take care of the separate property rights and obligations of each by accounting after the transactions are made. Similarly we take care of the requirements and needs of the officers in charge of the four main operating subdivisions, by lumping their purchases together, whenever possible, thus obtaining the greater advantages of buying in the largest volume practicable at each single transaction. The weight of the purchase is always an important factor in obtaining favorable prices, prompt service and convenient terms of delivery.

THE PENNSYLVANIA RAILROAD
OFFICE OF PURCHASING AGENT
PHILADELPHIA

1. In all probability there are more visitors to this office than to any other railroad purchasing agent's office. It is our wish that these visits be satisfactory in every way, not merely a how-do-you-do, good-bye or weather report conversation.

2. Visitors are given preference between the hours of ten A. M. and one P. M., Saturdays excepted, in that we try not to have meetings or conferences with our own officers or employees during those hours, and one way you can aid us in our endeavors is to write or telephone us of the subjects which you wish to discuss in advance of your visit.

3. Anyone visiting this office is interviewed by an officer, and one of our main objects is to save the time of visitors, not only by interviewing them promptly, but by making prompt replies to questions concerning matters of current development. When information requested cannot be furnished immediately, we will make every effort to give you an answer by telephone, telegraph or letter within twenty-four hours. Should you not receive an answer within that period, I shall appreciate it if you will bring the matter to my personal attention.

4. A record is kept of the number of visitors, by half-hour periods, as well as the number of visits by individuals. The February and March records are disappointing, because of the number of visitors we were obliged to keep waiting beyond the fifteen-minute period. We are glad to see and interview representatives, yet there is a possibility that many visitors are being delayed because of a few who make numerous visits, some of which may be unnecessary, and also due to the large number who visit this office between eleven and eleven-thirty A. M.

5. We aim to give you the best service, and to enable us to do so we invite your suggestions, and solicit your hearty cooperation in our endeavors to serve you, as well as the companies or organizations you represent, when visiting this office.

April 1, 1929. C. E. WALSH, Purchasing Agent.

Facsimile of Poster Issued by Pennsylvania Purchasing Department for Information of Visitors to Facilitate Operations

We now have in the Pennsylvania Railroad System a complete concentration of the buying work. In many respects, this carries with it advantages somewhat similar to those resulting from the systems of co-operative selling, which are attracting so much attention just now, particularly in certain branches of agriculture.

In a great railroad system like the Pennsylvania, there are thousands of men in official or supervisory positions who are constantly in need of materials and supplies. It seems to be inherent in human nature for everyone to think that he is a good buyer. Consequently, if the buying work of a system like ours were not closely controlled, we would have thousands of persons doing the purchasing without any regard whatever to uniformity, to standards or to the advantage of mass purchasing.

Moreover, the work would be done without the assistance resulting from expert knowledge. The buying faculty in its highest form, just like the faculty of selling or of administrative organization, must be cultivated and developed. To attain to the more advanced degrees of skill, years of experience are required. No system of local purchasing would ever give a large corporation the benefit of expert purchasing knowledge, which results from concentration of the work. Under our plan of purchasing, with the immense volume of supplies and materials which are constantly required, it is possible for our buyers to become experts in certain groups and classes of purchases. They develop special knowledge with respect to the materials or supplies themselves, the customs governing their markets and the personal characteristics of those who are engaged in their manufacture and sale. All of those are most important in buying skillfully and intelligently.

To give an example of how this works, let me refer again to the fact that the Pennsylvania System is divided into four principal operating subdivisions. Each of these is directed by a vice-president, with subordinate officers under his jurisdiction. Let us assume that in one of these regions a certain material of a certain grade is being regularly used for a certain purpose. Then let us suppose we find that the other three regions are specifying, for the same purpose, material of a more expensive grade.

The purchasing department is always trying to get the most favorable price at which material which will do the work properly can be obtained, taking into consideration

all related factors, such as quality, deliveries, service, etc. Therefore, if we find a situation like that described, there is at least a fair presumption that the officers in the region using the less expensive material are right and that the others are not exercising the problem from this point of view, and if we find that there is no sound reason for the differences in practice, we arrange to supply all four of the operating regions with the least costly grade. That has been demonstrated by experience to be satisfactory from all viewpoints. In that case, we lump the purchases and obtain the added advantage of buying in still larger volume, which frequently results in still more favorable terms of purchase than were previously obtainable.

Sometimes, of course, there are real reasons for materials of different grades being required at different points, even though at first sight the uses might seem to be identical. Furthermore, we do not endeavor to force the use of less expensive material in any case where any interest of the company suffers or any possible question of safety or dependability in operation is involved. The material must do the work with complete satisfaction. If we go below that grade, we risk sacrificing something in results. If we go above, we are spending money without a corresponding return. Many millions of dollars have been saved through just such investigations as I have outlined.

Purchasing and Stores Separate

As the Pennsylvania System is now organized, the purchasing department and the stores department are entirely separate. The general duties of the stores department include regulating the volume of materials and supplies on hand, and supervising their adequate distribution throughout the various points where they are needed. The primary requisite is to keep a sufficient amount on hand but to avoid over-supplies at any points. An overstock of material of any sort merely represents capital tied up for the time being in a non-productive form, and in fact, in many cases, in forms which are likely to deteriorate if the stocks are kept too long. Hence, controlling the volume of materials and supplies is a very important element in making the most effective use of the company's working capital.

Watch for Favorable Markets

In carrying out sound policies with respect to these problems, there is the closest co-operation by the purchasing department with the stores department work. For instance, in buying articles of which a large quantity is needed over a considerable period of time, we naturally try, whenever possible, to take advantage of a favorable market to purchase in heavy volume. But, in so doing, we arrange, if at all practicable, to place our orders with the privilege of drawing against them as needed, where the nature and uses of the material are such that this can be done. By this means, we help the stores department to avoid the accumulation of high inventories, and aid in keeping at a minimum the working capital necessary to carry the stocks of material awaiting consumption.

We believe in encouraging home industry. This is another way of saying that we buy largely, though not exclusively, in the territory served by our own lines. From every viewpoint, this is a sound procedure. In that part of the United States east of the Mississippi river, and north of the Ohio river, are located many manufacturing districts. Almost everything the Pennsylvania uses or has to buy can be secured from places which its lines of railroad reach. Certain kinds of timber are an exception. West coast lumber and the pines from the South and Southwest are drawn upon heavily. With all that, there are still important areas in our own territory from which various kinds of forest products can be obtained, and still leave standing timber for future growth.

In the volume of its purchases and its methods of making them, the Pennsylvania is believed to exemplify a fact which should be better known throughout the country, that railroad buying on the one hand is done economically and efficiently, and that the American railroads are among the best and most valuable customers of the nation's industries and mines.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 27 amounted to 1,101,061 cars, an increase of 66,735 cars as compared with the corresponding week of last year and 56,364 cars as compared with 1927. Increases as compared with the corresponding weeks of the past two years were shown in the loading of all classes of commodities except live stock and forest products, which showed decreases as compared with 1927 but were above the corresponding week of last year. All districts except the Southern reported increases over the figures reported for the past two years. The Southern showed a reduction in loading as compared with both 1928 and 1927. The summary as compiled by the Car Service Division of the American Railway Association follows:

Revenue Freight Car Loading

Week Ended Saturday, July 27, 1929			
Districts	1929	1928	1927
Eastern	248,503	234,045	235,729
Allegheny	226,045	208,629	211,631
Pocahontas	60,921	56,965	59,926
Southern	140,567	142,049	151,324
Northwestern	173,632	157,697	159,943
Central Western	166,112	154,466	150,123
Southwestern	85,281	80,475	76,021
Total Western Districts	425,025	392,638	386,087
Total All Roads	1,101,061	1,034,326	1,044,697
Commodities			
Grain and Grain Products	70,076	55,305	58,801
Live Stock	24,116	22,037	26,434
Coal	164,373	156,222	158,412
Coke	11,704	8,632	9,524
Forest Products	67,737	65,473	69,544
Ore	80,234	62,651	64,442
Merchandise L. C. L.	257,782	255,296	256,745
Miscellaneous	425,039	408,710	400,795
July 27	1,101,061	1,034,326	1,044,697
July 20	1,078,695	1,033,843	1,012,585
July 13	1,064,632	1,024,925	1,017,394
July 6	908,832	850,947	839,085
June 29	1,095,724	1,003,699	1,021,438
Cumulative totals, 30 weeks	29,750,158	28,405,814	29,434,801

The freight car surplus for the period ended July 23 averaged 216,136 cars, an increase of 4,971 cars as compared with the preceding week. This included 106,935 box cars, 64,473 coal cars, 24,582 stock cars and 14,141 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 27 totalled 70,056 cars, a decrease from the previous week of 1,775 cars and an increase over the same week last year of 846 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
July 27, 1929	70,056	38,885
July 20, 1929	71,831	37,911
July 13, 1929	73,114	36,267
July 28, 1928	69,210	37,743
Cumulative Totals for Canada		
July 27, 1929	1,985,126	1,254,729
July 28, 1928	1,931,850	1,169,122
July 30, 1927	1,818,842	1,136,528

Soo Line Buffet-Lounge Cars

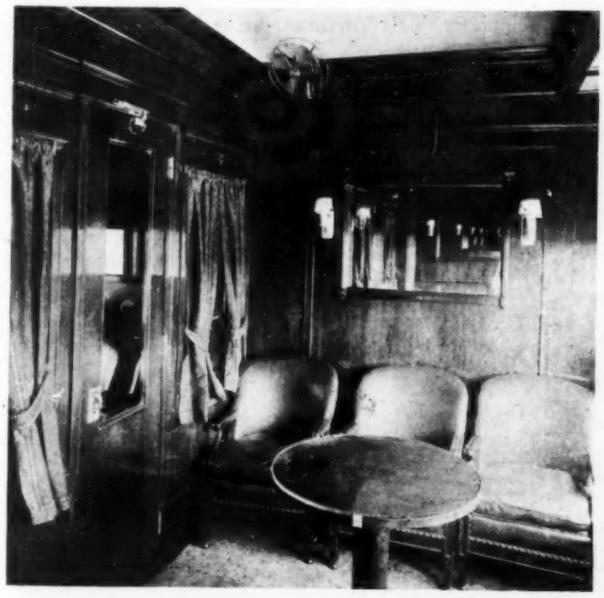
Four new cars embodying latest features will replace compartment-observation cars in through service

THE Minneapolis, St. Paul & Sault Ste. Marie has recently received from the Pullman Car & Manufacturing Corporation four new buffet-sun parlor-lounge cars, designed for use in the "Mountaineer," a solid sleeping-car train operated during the summer months over the Soo Line and the Canadian Pacific between Chicago and Vancouver, B. C. Four cars of similar design, built at the Canadian Pacific shops, will also be used in "Mountaineer" trains. In previous years compartment-observation cars have been used on these trains, and the new lounge cars, providing additional facilities and comforts, are designed to take their place.

In construction, the new Soo Line lounge car embodies standard Pullman features, having a wide upper deck and cast steel buffers, with a wide vestibule at the forward end. The trucks are of the cast steel, six-wheel pivoted-equalizer type. The braking power is transmitted to the truck wheels through Simplex type clasp brakes.

Double wood sash are used throughout the car, outside sash in the main rooms being fitted with window ventilators. The vapor system of steam heat, with thermostatic control in the observation room and the smoking room, is used. Auxiliary heat is furnished by a Pullman two-coil hotwater heater. Ventilation is furnished by 14 exhaust ventilators with sufficient intakes to ventilate the car properly. Exhaust fans are located in the sun parlor, smoking room, the women's lounging room and the buffet. There are four 12-in. bracket fans in the observation room, one in the sun parlor, two in the smoking rooms and one in the women's lounging room.

The general finish is of American walnut, with attractive decalcomania decorations, except in the buffet, toilets and bathrooms which are lacquered in a clear light color.



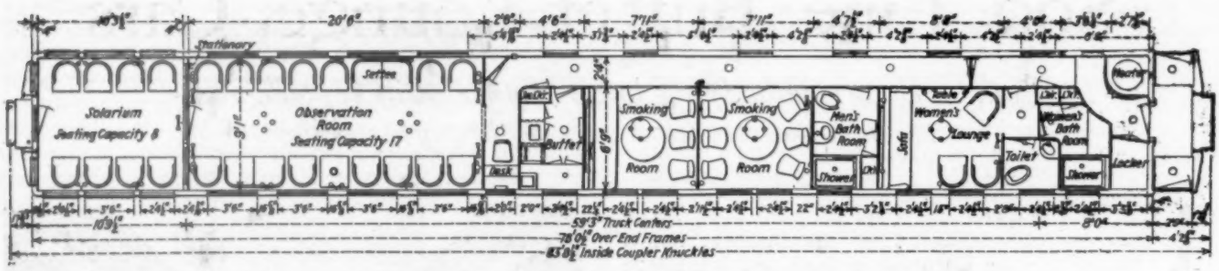
Attractive Smoking Room Finished in Natural Walnut

Interior View of the Observation Room Showing the Decoration and Equipment

The dominant tone of the sun room is a light cool green, the walls being painted in green with the ceiling also in green but of a lighter shade. Pantasote window shades in the sun room are of green and gold. The floor covering is green and white rubber tiling of marbleized design in three inch squares and harmonizes with the green motif of the walls. There are eight wicker chairs in the sun room upholstered in a flowered green fabric. The background of the fabric is green and the flowers forming the pattern are of bright colors introducing color into the room. The chairs themselves are painted a darker shade of green than the wall color. There are no ceiling lights in the sun room, light being introduced by making use of four two-light brackets which are placed on the side finish, two on either side of the room. The fixtures, of Pullman manufacture, were especially designed for these cars and have Ivrene shades. The windows are fitted with Vita-glass and are provided with storm sash, also fitted with Vita-glass.

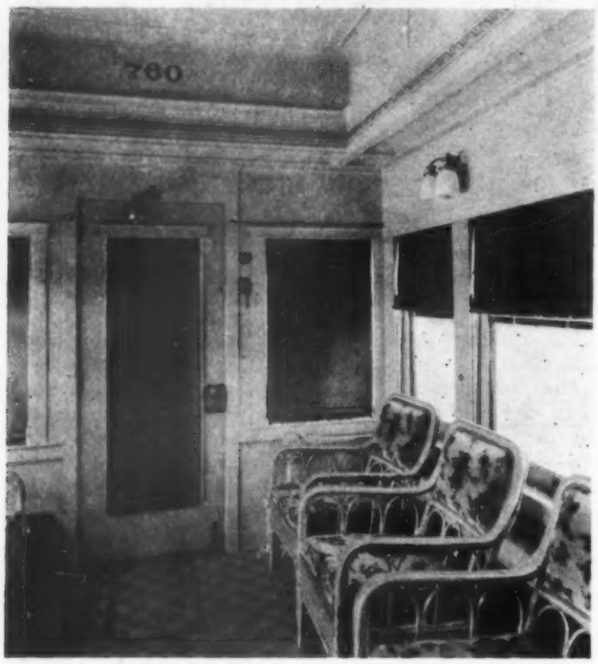
The Observation Room

The side finishes and bulkheads in the observation room are of natural American walnut of a rather light shade. The design of the interior finish is plain, and the beauty of the design is brought out by the graining and natural color of the walnut rather than by ornateness of window trim. The ceiling is painted in ivory color with striping lines of light brown. The window headers at the side finishes and the door headers at the bulkheads are ornamented with a decalcomania design which is floral in type. The carpet is a Wilton, the pattern of which is a copy of an old Ispahan rug. Three different types of fabrics are used in this room for seat coverings. Two chairs, of a comfort-



Floor Plan of the New Soo Line Buffet-Sun Parlor-Lounge Car

able lounging type, are upholstered in a striped mohair with a brown ground and bright stripes of gold, blue and red making the pattern. Four chairs are upholstered in a floral figured pattern of taupe brown with bright complimentary colors in the flowers. The settees



The Solarium, Finished in Light Green and Equipped with Eight Wicker Chairs

and the balance of the chairs are upholstered in a faun colored mohair fabric with a gold ground. The window shades or Pantasote curtains are of brown and gold. The lighting fixtures in the observation room were also especially designed for these cars and consist of wall brackets which are applied on the piers between the windows and on the bulkheads. The ceiling lighting is accomplished by two four-light chandeliers. All shades in this room are of the new calcide type. The fixtures are hammered, of English design. A writing desk and bookcase are located between the observation room and the buffet. Six serving stands fitted with ash-trays are included among the furnishings of this room.

Smoking Rooms and Women's Lounge

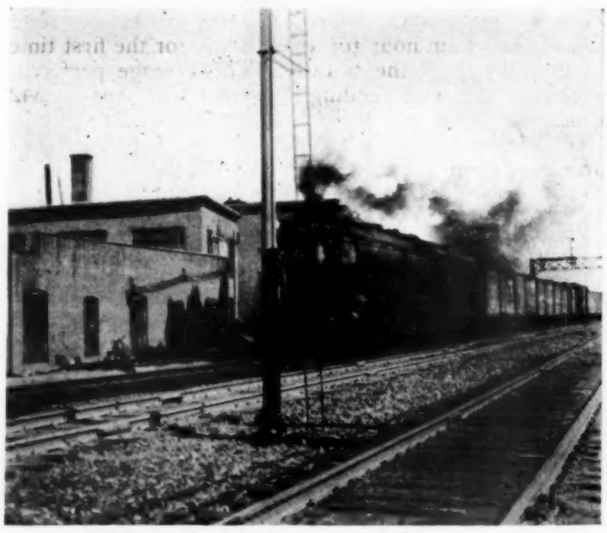
The smoking rooms are finished in natural walnut and the ceilings in ivory the same as in the observation room. The rooms are equipped with glass top tables for playing cards. The two smoking rooms are separated by a low partition. The windows at the passageway have draperies of walnut-colored damask. The carpet and the window shade material are the same as in the observation room. The chairs and sofa in the smoking rooms are upholstered in brown leather and the chairs themselves are of natural walnut. The decalcomania decoration is of the same type as the observation room, but of a little different size and design, placed over the windows at the side finish and on the passageway side. An ornamental mirror is provided on the bulkhead in each room.

The women's lounge is finished in natural walnut and the ceilings are in ivory of the same general design as the observation room, with the carpet and window shades the same. The decalcomania decoration placed on the side finish and over the mirrors are slightly more feminine in type and a little different in design from those used elsewhere in the car. The lighting fixtures in the women's lounge are of a lighter design and have silk shades. The chairs and sofa are upholstered in a taupe colored material with a rose ground. Ornamental mirrors are furnished over the sofa and over the dressing table. Two electric curling irons are available in this room.

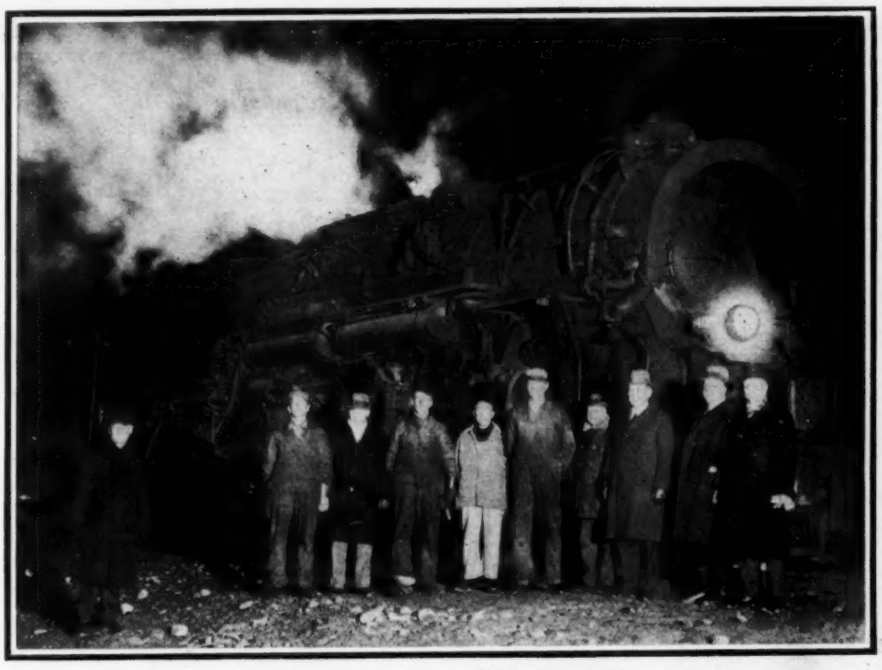
The buffet is equipped for serving ice cream and soft drinks. The floor is covered with green and white marble effect rubber tiling. The bath rooms in the car, of which two are provided, one for the men and one for the women, are painted in ivory with black and white marbleized rubber tiling. The showers are enclosed with glass panelled partitions and sliding doors.

The car is arranged for outside telephone service with a telephone instrument at the writing desk.

* * *



On the Lackawanna at East Stroudsburg, Pa.



The Arrival of the First Locomotive to Run Through from Mechanicville, N. Y., to Portland, Me.

Rebuilding a Railroad's Operating Methods

Boston & Maine promotes efficiency and morale by daily statistics and other means

Part II

DURING the month of October, 1928, the Boston & Maine exceeded 20,000 gross ton miles per train hour for a full week, for the first time in the history of the railway. The average performance for the week ending November 29 was 21,342 gross ton miles per train hour, breaking all records. Even after the fall traffic peak was over, the performance was continued at a new level. In the week ending May 16, for example, the figure was 20,150 miles.

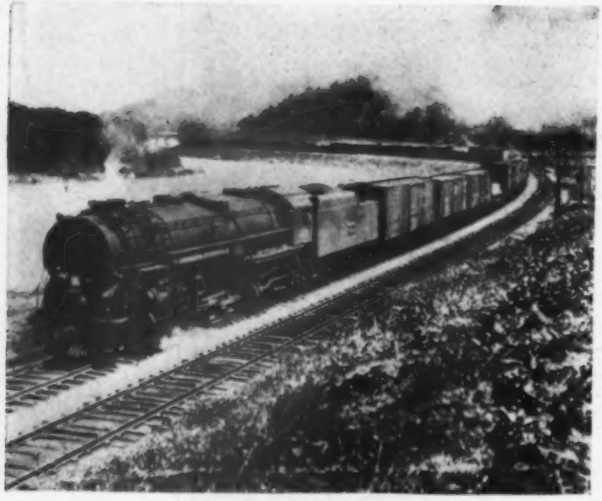
As explained in Part I of this article, which appeared in the issue of July 27, this is the result of a carefully conceived plan for the improvement of facilities and operating methods. A highly important adjunct of this plan has been the system of supplying daily operating and cost statistics, thus providing a means for intelligent and timely supervision and, at the same time, encouraging the spirit of competition.

The daily figures are supplied to the supervisory and executive officers by the bureau of statistics, which was formed on October 19, 1925. Since that time, the scope of its activities has been materially broadened. It is divided into two sections, one handling routine statistics, while the other makes all special studies. The latter phase of the bureau's work is important, the rule being, on the Boston & Maine, that all expenditures made for facilities, that cost over $5,000 are checked to determine whether the expenditure was justified by the savings produced in actual operation. The special section of the bureau also prepares all data necessary to introduce as testimony at hearings before the Interstate Commerce Commission, or other regulatory bodies. Public records of railways other than the Boston & Maine are also maintained by the bureau.

Building Up the System

One of the first tasks begun by the bureau was the revision and standardization of all reports. Men from the bureau were sent out on the line to cover the road completely. These men instructed the local clerks as to the proper methods of preparing the reports. They also explained the purpose of the reports and the uses to which they were put, and did everything in their power to enlist the interest of the employees in the reports and their preparation, not merely as a routine chore, but as an integral and important part of railway operation.

The continued accuracy of the reports is insured by frequent checking of the records at the source, at yard offices, stations, engine terminals, etc. These periodical



A Full Tonnage Train Near Zoar, Mass.

checks for orderliness and accuracy are conducted by field men working out of the bureau. Statistics are no more valuable than the comparative degree of accuracy with which the basic records are maintained at the source. Realizing this, the Boston & Maine has given particular care to this all-important point.

While monthly reports are issued, they are, as a rule, only summaries of the daily and weekly reports, and are compiled primarily to meet the requirements of the Interstate Commerce Commission and other public bodies. The daily and weekly reports, and particularly the former, reflect and aid in controlling the operations.

The Daily Reports

A complete check of yard operations is provided in a daily report covering yards where regular switching engines are employed, which shows the average number of cars received per engine hour. This report includes both daily and cumulative figures, with a comparison with the previous year, on the following:

Loaded cars received per engine hour
Empty cars received per engine hour
Total cars received per engine hour
Weather conditions
Temperature

The basic data from which this report is compiled are taken from a telegraphic report received from all yards at 7 a. m. daily. The report is distributed on the same day that the information is received, usually about noon, and is sent to all yardmasters and to the agents, as well as to division and general officers. It provides an immediate check to show whether the assignment of yard power is following closely any change in the volume of business. It covers 29 yards in all.

Another daily report is prepared covering freight station operations. This report includes the following information:

Total tons handled
Total expenses
Cost per ton
Piece work rate
Reasons for excess
  Guarantee
  Punitive overtime
  Holiday pay
Cost per ton, normal week, hourly basis
Effect of run tonnage
Net savings per ton
Savings on tons handled

The basic data from which the report is compiled are reported to the statistical bureau on the day following the 24-hr. operation to which it applies. The report is mailed to the agents and to division and general officers on the second day. It provides a quick measure of the agents' efficiency in adjusting their forces to meet the change in the volume of tonnage offered for handling. The unit cost is measured on the basis of the piece work rate in effect. The report covers the 13 largest stations on the Boston & Maine.

A daily and cumulative report is also made up covering freight train operation, which contains the following comparative data.

Gross ton-miles
Gross tons per train
Gross tons per locomotive
Gross ton-miles per train hour
Gross ton-miles per locomotive hour
Train miles per train hour
Pounds of coal per 1,000 gross ton-miles

This information is shown by divisions and for the system as a whole, and includes system figures on car miles per car day, both total and excluding bad order and surplus cars, and the figures for the system are compared with the corresponding figures of a year ago.

The train statistics that are used in making up this report are taken from the conductor's wheel reports, when all trains on the roster for the day covered are accounted for, while the fuel performance is taken from the corresponding fuel records. The report permits remedial methods to be applied to adverse tendencies in train operation before they have gone too far and is mailed to general and division operating officers on the fourth day after the day to which it pertains. It covers all of the divisions separately, together with the totals for the system.

A daily report of gross ton miles per train hour on the system and on each division separately is telegraphed to each superintendent between 4:30 and 5 p. m. daily. This is compiled from the conductor's wheel reports, which are on hand at noon each day, covering the previous 24-hr. period, which ends at midnight. Complete wheel reports are usually available on 85 to 90 per cent of the trains at that time, and the overlapping wheel reports from day to day offset each other, so that the gross ton mile figures are reasonably accurate. This is wired to the superintendents so that they may have each day, before they leave the office, a close approximation of the previous day's performance.

The fifth daily report shows the car situation as of 11:59 p. m. daily. It gives the current and cumulative figures on the following items:

Cars received from connections (Loaded, empty, total)
Cars delivered to connections (Loaded, empty, total)
Cars loaded on line:
  To off-line points
  To local points
  Total cars loaded
Total loaded cars handled
Total cars on line
Cars on hand awaiting unloading
Cars unloaded previous 24 hr.
Stored and surplus cars

The cars on hand, cars loaded and cars unloaded are estimated on the basis of telegraphic reports received each morning from 24 major stations, constituting 70 to 80 per cent of the total handled at all stations, while the receipts and deliveries are taken from the daily interchange record. This report is sent to the general officers at noon on the day following the 24-hr. operations to which it applies, and provides an immediate check of the volume of current traffic, in addition to valuable comparisons.

Once each week, a complete comparative summary of freight and passenger train indices for trains, cars and

locomotives, is made and forwarded to general and division operating and mechanical officers. It includes the physical items measured up with the three major items of operating costs. The cost figures in this report include the following:

Wage cost per 1,000 gross ton-miles
Fuel cost per 1,000 gross ton-miles
Locomotive repair cost per 1,000 gross ton-miles
Passenger wage cost per train mile

It also includes a detailed analysis of the wages, divided as between classes of labor and shown separately as to each division, together with a comparative analysis of the fuel costs. It is customary also for the manager of the bureau to include with this report four or five pertinent paragraphs of comment on its outstanding details. The report supplies the subjects for discussion at many operating staff meetings.

A weekly comparative report also summarizes the freight handling and yard costs. The basic information is supplied from the daily reports covering these operations, previously referred to, and the unit costs shown supply the subordinate officers with information as to the spread between their production and expenses. The payroll week ends on Thursday on the Boston & Maine and this report is distributed the following Thursday.

A separate weekly report is prepared on rail motor car performance, giving the following information for each of the 24 rail motor cars owned:

Car number
Type of car
Train miles
Car miles
Ton-miles
Gallons of gas used
Train miles per gallon
Ton-miles per gallon

This information is compiled from special reports received from the mechanical and stores departments weekly. It is sent to general and division operating and mechanical officers and to each motor car operator, within five days after the expiration of the week to which it refers.

The fourth weekly report covers the operations at each of the 25 engine terminals, divided as to divisions. It shows comparative figures for the following items:

Engines dispatched
Cost per engine dispatchment
Repair cost per engine
Repair cost per 100 engine miles

It is distributed five days after the close of each week's operations, and is compiled from special reports prepared at the various engine terminals.

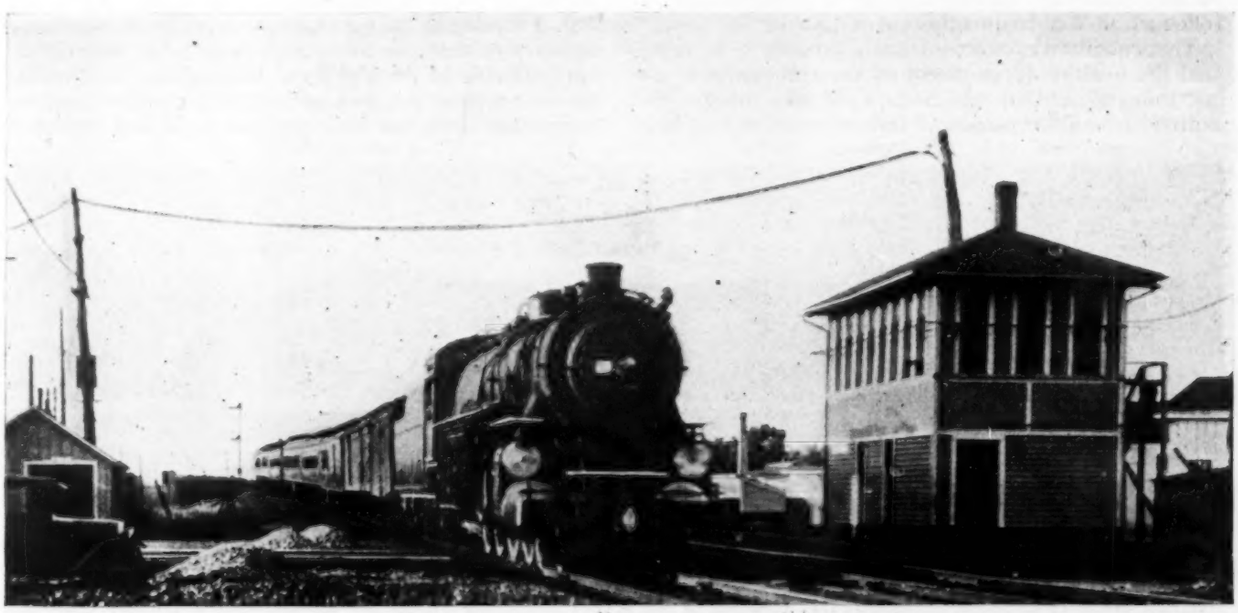
Timeliness and accuracy characterize these reports. Definite routes and schedules have been worked out for getting the information to Boston at the specified time and such routes and schedules are adhered to closely.

Competition Fostered

In addition to the obvious benefits derived from these reports in the way of intelligent supervision of operations, they are designed so as to foster friendly rivalry between the employees and supervisors of the various divisions and at the stations, yards and engine terminals. Each man concerned is given complete and accurate information not only as to his own operations, but as to similar operations at other places as well, thus giving him a check on what is going on all over the railway, and inspiring him to improve his showing if he finds he is lagging behind.

Under the former line-up of operating divisions, there could be no fair comparison of results as between divisions, because of the wide variance in operating conditions. Certain divisions, because of local conditions, were always far behind some of the others in performance records. When the re-assignment of operating divisions took place, as described in Part I of this article, the general manager did not lose sight of this fact. This re-assignment was, of course, based primarily on operating necessities, but, other things being equal, a non-productive branch line was frequently assigned to the division best able to stand the drag on its operating performance. In this manner, conditions were equalized, so that real comparisons between divisions could be made, supplying an incentive to each superintendent to do his best.

* * * *



On the Chicago, Rock Island & Pacific at Gresham, Ill.

Conservation of Railroad Frontage for Industry

By G. E. Fetterman
Industrial Agent, Eastern Region, Pennsylvania

THE general impression that concern over the conservation of industrial acreage is unwarranted fails to take into consideration certain economic factors which are vital to the success of any industry. Nearby labor, convenient transit facilities, proximity to primary markets, and sources of raw materials or semi-finished products, are some of the elements which combine to determine the value of industrial sites.

The superior service of a particular railroad will not necessarily determine the location of a site if other factors are out of line. Acreage possessing the necessary combination of advantages that give a site real industrial value is not unlimited and is, therefore, rated at a premium. A railroad itself can do very little to improve the situation, although elimination of grade crossings, changes in line, construction of new lines, and other physical improvements have a bearing on the problem, and sometimes afford opportunities for constructive action.

The owner of real estate is, quite naturally, disposed to use his own judgment and discretion in matters concerning the use or disposal of his property. Therefore, it seems that the community is the logical agency to coordinate and direct the various, and frequently conflicting, interests to the end that systematic planning for the public good may displace "cut and slice" methods of dealing with questions affecting local growth.

Even in the East, where industrial activity is becoming so concentrated in and about the larger communities, the wasteful or misdirected use of primary industrial acreage arouses little, if any, real concern on the part of the legislative bodies and executive authorities involved. In the opening of thoroughfares and in the improvement or extension of streets or highways, some antiquated city plan, which does not contemplate the future industrial requirements of the community, is followed all too frequently.

The cumulative effect of such procedure is to retard the healthy development of the communities—the last thing a railroad wishes to have take place. The railroad position is obvious. Its own welfare to a large extent is dependent upon the growth and prosperity of the cities and towns served. Therefore, protection and intelligent development of the industrial acreage in established industrial communities is of vital importance to the transportation companies.

Land cannot be made, although it can be improved or reclaimed. Along navigable rivers the established bulkhead and pierhead lines determine the extent of the submerged area that can be improved, as well as the character of the improvements. Land can be used for one purpose and later converted to another use, but, as a rule, land that has lost, even in a slight degree, its identity as industrial property presents both engineering and cost problems that deprive it of its original maximum development possibilities. Each succeeding change may so restrict the uses to which the land can be put that eventually it is without practical value for industrial purposes.

The following actual situations show how railroad frontage is often increased, restricted and even destroyed:

1. The distance from a railroad to a highway is 400 ft., and from the highway to a navigable river is 3,600 ft. Both parcels have a frontage of 1,200 ft. on the highway, and the former parcel has a similar frontage on the railroad. The total area between the railroad and the highway is ten acres, while more than 100 acres lie between the highway and the river. If it were impossible to cross the highway with a sidetrack to serve the larger area, it would require a frontage of approximately two miles along the railroad to make available for development an equal area between the railroad and the highway.

In that case, the cost to the municipality of extending the sewer and water mains would be heavy, and unless the city were willing to make these improvements in advance of any tangible development of the property, it probably would be difficult to sell the land, because industry usually does not like to wait for city councils to act. As a matter of fact, in the actual case under consideration, the side-track was built across the highway prior to improvement. It probably would be impossible now to obtain permission from the city and state authorities to cross the highway with a side-track.

2. Property east of a highway is occupied by a large industry, which also owns a piece of land lying on the opposite side of the highway. The railroad runs along the west side of this acreage. Anticipating the need for using this land, the industry has petitioned the state

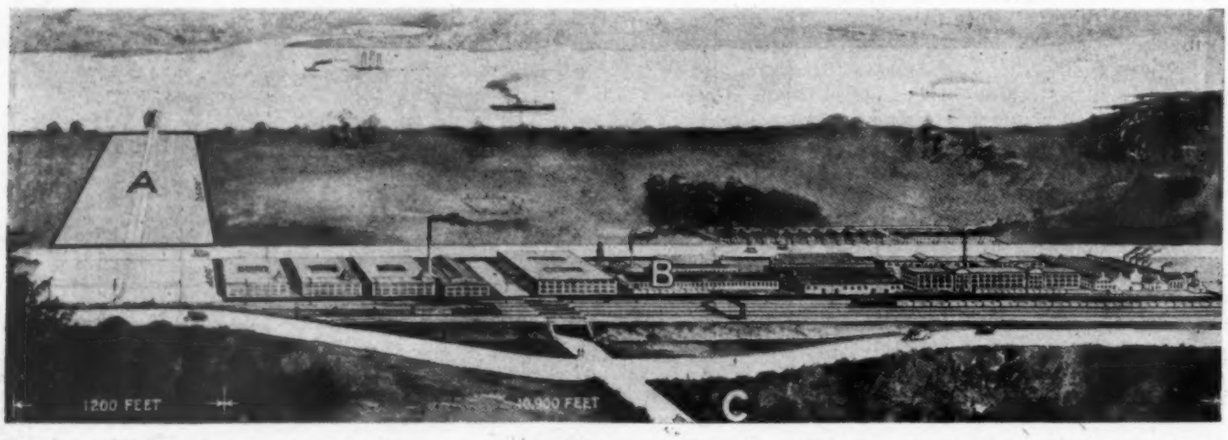


Diagram Showing Improper Industrial Development of 100 Acres Requiring 10,900 Ft. of Railroad Frontage With No Access to the River and the Same Area Properly Developed Using Only 1,200 Ft. of Frontage

highway department to relocate the highway along the west line of the property, adjacent to the railroad right-of-way.

If this proposed change affected only the property of this particular industry, little opposition would develop. It so happens, however, that the suggested relocation would place the new highway between the railroad and several other properties. As the heavy traffic over this highway is constantly increasing, owners of these pieces of land fear the proposed relocation would eventually cut off their land from siding connections, thus greatly depreciating its value as industrial property. The railroad is interested in the case, because this particular district promises to show an intensive development in the near future, and the available industrial acreage is scarce.

3. A certain company had tentative plans prepared for the erection of a factory, just north of its present plant, to manufacture a new line of goods. Then the company learned that the state highway department plans to build a new highway which is to cross the railroad at this point on an overhead bridge. Unless the plans for this bridge, which would clear the tracks by nineteen feet or more, are abandoned by the State, the company will be forced to forego building its new plant on the site originally chosen, because the highway bridge would make it impossible, from an engineering standpoint, to coordinate effectively the operations in the present and proposed plants. Another site for the proposed bridge has been suggested to the state highway department, but the final decision in this case cannot be forecast.

Consideration has been given to the suggestion that a clause, granting the railroad the right to extend a siding to reach another industry, in cases where an extension would not be detrimental to the first industry, be incorporated in side-track agreements. This would permit the railroad frontage to be increased through development in depth, and also would enable the railroad to avoid additional turnouts in the running tracks. Ability to enforce a clause of this character is, however, open to question.

In the case of acreage contiguous to the railroad right-of-way, little, if any, intelligent planning has been done to guard against the wasteful or misdirected use of the land. Of course, the owner of property has a constitutional right either to dispose of or develop his land as he pleases, but a community cannot justify an attitude of indifference when obstacles are thus being raised to its future growth and expansion.

The most common abuse to which industrial acreage is subjected is the unsound practice of locating streets and highways parallel with and near the railroad right-of-way. In many cases, the evil which invariably follows does not become apparent immediately, because the highway may not be used much for several years. As long as it carries light vehicular traffic, it may be crossed with industrial sidings at grade, but the objections to grade crossings increase as the traffic increases. In time, the density of highway traffic will prevent the construction of additional grade crossings. When this situation arises, as it does frequently, the railroad pulls out its land cards and eliminates a promising tract of primary industrial acreage.

Power companies, in their desire to serve existing industry and further develop the territory, usually follow the course of least resistance. In building transmission lines and supporting towers as economy suggests, they frequently traverse land adjacent to a railroad in a way that decreases its potential industrial value.

A railroad, by pointing out to property owners the potential industrial value of the land not contiguous to the right-of-way, but which can be reached by spur tracks, is creating opportunities which promise substantial returns to the property owner, as well as to itself. This suggests that a liberal policy on the part of a railroad in regard to the construction of industrial spur tracks is wise.

In particular, foresight should be exercised to avoid the creation of industrial barriers paralleling the railroad tracks. The development by industry of a comparatively narrow strip of land along a railroad, without provision for spur tracks leading to the valuable acreage in the rear, is as detrimental to the industrial growth of a community as the presence of a broad concrete highway between the railroad and potential industrial land.

A situation which exists in a certain eastern city provides an appropriate illustration. A wide, improved street, with a double-track trolley line, parallels a railroad at a distance of about 1,000 ft. The property between this highway and the railroad is being rapidly developed industrially. The railroad also operates an industrial branch which crosses this highway overhead. The owners of the property on the far side of the highway have negotiated with the railroad and arrangements have been made to construct an industrial spur track connecting with the branch line beyond its crossing of the highway. This industrial spur track also will parallel the highway, thus permitting the development of the land on the far side of the highway. Existence of the industrial spur, with its bridge over the highway, was the only feature that saved this situation.

The wasteful or misdirected use of railroad frontage is so general that it can no longer be regarded as a natural development. If it were confined to small areas, adverse criticism would have to be tempered with reason, based on a full knowledge of the underlying conditions, but when large tracts are devoted to playgrounds, athletic fields, community centers, armories, cemeteries and institutions, the foresight of those responsible for the issuance of building permits or special licenses certainly is open to question.

A number of cities have adopted zoning ordinances, designed to protect the property rights of individuals, as well as to guide the development of the community along a predetermined course. Zoning systems are unquestionably good as far as they go, but they fail in one important respect. For example, a district is designated for heavy manufacturing, but the internal development of the district is usually permitted to proceed without much supervision. Without a preconceived plan and some sort of centralized supervision, undesirable conditions, such as previously mentioned, will inevitably be the result.

In a few cases, notably the Central Manufacturing District in Chicago and the Port Newark Terminal Development in the vicinity of Newark, N. J., a group of individuals, or the municipality itself, have recognized the need for controlling large tracts of land devoted exclusively to industrial purposes. This course is commended to the consideration of all industrial centers.

Some may possibly feel that long concentration on this subject has conjured up some rather fanciful ideas. But the questions raised cannot be dismissed lightly, because, unless early preventative action is taken, communities that are squandering their available railroad frontage will awaken some day to a full realization of their plight and the impossibility of effecting any improvement at that late date.

Communications and Books

Advertising American Railways Abroad

NEW YORK.

TO THE EDITOR:

The American railroads are up against strong competition for passenger traffic, but by efficient planning they can meet it. Advertising, to be effective, ought to be carried on all-the-year-round. It should call attention to the traffic facilities, schedules and fares, as well as the particular territory served by the railroad. Everybody interested in travel has witnessed the continuous advertising done by foreign shipping concerns, international tourist agencies and foreign government travel bureaus in this country. Their campaign is intensified soon after Christmas and kept up well into the summer. Thousands of Americans are attracted abroad each year by this campaign. Then, with the summer almost here the American railroads start their "Reduced Summer Rates" campaign, at a time when many people have already made up their minds that they are going abroad, and have purchased their steamer tickets.

The writer gladly leaves the details of railroad advertising to the experts; but in placing advertisements the smaller papers, read by the "homefolks" should not be overlooked. The writer has traveled on reduced summer rates out West, but has met hundreds of people afterwards who never knew that there were such rates and such opportunities to travel; however, they knew the steamer rates to Europe.

And now as a third and last suggestion: Why couldn't the United States become a travel territory for Europeans, as Europe is for Americans? Europeans are not all poor people, as seems to be the belief in many quarters of this country. In fact, there are thousands of people abroad eager to visit the United States, and who also have the means (even if moderate) to take a trip in the East, Middle West, or all through this country.

Again it becomes a matter of advertising on the part of the leading railroad companies. The writer was abroad two years ago and found that little advertising is done by American agencies to attract European tourists to visit the United States. (Much red tape at the American consulates is also detrimental). Europeans are naturally a bit spoiled as regards scenery, and they are not accustomed to train rides of 24 hours and more. Hence, advertising in Europe should not only call attention to scenic attractions, but should also emphasize the comforts of train service, the fast schedules, the various rates and the routes and circular tours offered by the American railroads.

It is not sufficient just to send a lot of printed matter (in English) over to the European representatives as has been done in the past. American concerns advertising abroad should take a tip from the foreign agencies in this country, and write their copy in the language of the country to which the travel literature is sent. This is important, although often overlooked.

FRED EIDENBENZ.

The Demagogue and Facts

ABILENE, TEX.

TO THE EDITOR:

"Pay the Cashier" was the mandatory inscription written on the guest check handed to a United States senator by a waiter in a modern restaurant. Remembering the lessons of economy which he had absorbed in that august body, the United States Senate, the senator scanned and footed the items on the check. "Roast Beef—Eighty Five Cents" was the first item that caught his well trained, economical eye. His indignation knew no bounds, and in giving vent to it a great light penetrated his senatorial brain. Like a flash, this guest check revealed to him the answer to the momentous farm relief question which has agitated the country for so long a time. Future generations should have the benefit of his vision; therefore, the senator had the menu published in the Congressional Record.

"If you will notice the prices we pay for farm commodities on those bills of fare and what the farmer gets for them," said the senator, "you will see proportionately how much we pay for freight rates." It is estimated that it took four ounces of roast beef to satisfy the palate of the senator. If this estimate be dependable, he paid for his roast beef at the rate of $3.40 per pound. The same paper that carried the news item in reference to the senator's dinner quoted $15.00 per hundred pounds as the top price paid for beef cattle on that date. The margin of profit is $325 per hundred, or $3.25 per pound, all of which, according to the senator, went to the railroads. Reducing it down to the senator's dinner, the railroads received the sum of 81 cents for hauling four ounces of roast beef to market. But the senator made a little error of 13,000 per cent in his calculation.

From El Paso to Chicago, a distance of 1,640 miles, the freight rate on beef cattle is 89 cents per hundred pounds. It is probable that the senator's dinner was shipped a lesser distance. If the railroads had eliminated their charge entirely, and had hauled his beef absolutely free, the senator would have effected a saving of 2½ mills. Instead of paying 85 cents for his dinner he could have gotten it for 84 cents, 7½ mills.

It may be argued that there are horns, hoofs, hide, and internal accessories to be taken into consideration, which the senator did not eat. The railroads haul all these by-products, and they are converted into cash.

The senator who thus attempted to mislead his constituents and others has at his command the rates of the railroads and a record of everything they do, even down to the pound of the freight they haul and the ton-mile rate. He also knew that the average return of the railroads on invested capital for 1928 was only 4.66 per cent, for 1927, 4.31 per cent and in the last ten years it has been as low as 0.09 per cent.

An editorial writer in commenting on the senator's sally of wisdom said in derision, "the unconscionable railroads are to blame." We wonder if it hurt the senatorial conscience any to distort the truth to the extent of 13,000 per cent.

W. R. LENCE,
General Manager, Abilene & Southern.

An International Esperantist Association for Railwaymen

LOUISVILLE, KY.

TO THE EDITOR:

An international association of railroad men for the purpose of promoting communication with each other through the medium of Esperanto, the artificial international language, was organized originally before the world war, but was abandoned during that period, and was re-organized again in the year 1921. The name of the association "La Internacia Asocio de Esperantistaj Fervojistoj" (The International Association of Esperantist Railwaymen) indicates pretty well the object of the association—this is, in general, to carry on those activities that are of interest to railroad men of all departments and, in particular, to develop a technical terminology in Esperanto suitable for use between railroad people of the different nations.

The association publishes a monthly gazette in which the members may exchange ideas and find out what is going on in the rest of the world and how other railroad men live and work. The latest information I have been able to find in regard to the membership is for 1926 at which time there were 630 members in 18 different countries. Membership dues are made as small as possible, $1 per year, with ten cents additional with application to cover the cost of membership cards, etc. A special membership is open to those not railroad employees but who desire to support such a movement, and to railroad employees not Esperantists, or who wish to learn Esperanto. The dues for the latter classes are the same as for the former.

The growth of this organization is, of course, more or less

bound up with the spread of the Esperanto language. According to my information, Esperanto is now spreading quite rapidly in Europe, and also in this country. It has been authorized as a subject for teaching in the public schools of four countries of Europe. In 1921 a favorable report was made by a committee of the league of Nations and accepted by that body, and the language is now being used by the International Labor Bureau. This organization issues a monthly bulletin in Esperanto. The number of commercial organizations and international associations using it are too numerous to mention in this letter, but I believe it would not be too much to say that most of the international associations have passed resolutions favorable to its use for international purposes.

The language is quite simple and easy to learn. It is entirely regular, the whole grammar being given in 16 short rules—and there are no exceptions. The pronunciation is phonetic; accent falls always on the next-to-last syllable, and each letter has an invariable sound, the same in whatever position it may be found in the word. The roots of words are as international in character as possible. It is said that 83 per cent of the Esperanto roots are recognizable by an English-speaking person. One may note how the word for railroad man, "fervojisto" is built up from the roots "fer", meaning *iron*, "voj" meaning *road*, the suffix "ist" meaning *one habitually occupied with* and "o", which is the ending letter of all nouns. One does not have to learn thousands of words as in learning a new natural language, but by the use of the grammatical endings and about 35 affixes the learning of one new word often adds 20 or 25 new words to the vocabulary.

Last year railroad employees of Austria sent out a general invitation to Esperantist employees of every land to visit their country for three days. The visitors were to be entertained in the homes of the Austrian railroad men and were to be under no expense, even for hotels. Such intercourse between people is certain to be of great benefit to all concerned.

Further details regarding the association may be obtained by railroad men who are interested by addressing the writer at 3907 W. Parkway, Louisville, Ky.

C. C. FEARS.

[The writer of this letter, a train dispatcher, wrote us seeking certain information regarding American railway practices in which one of his Esperantist correspondents, a high railway officer in Europe, was interested. In supplying Mr. Fears with this information we asked him to tell us something about the Railwaymen's International Esperantist Association and the letter published herewith was submitted in response to this request.—THE EDITOR.]

New Books

Accounting by Machine Methods, by H. G. Schnakel and Henry C. Lang. 563 pages, 6 in. by 8½ in. Bound in Cloth. Published by Ronald Press Company, New York. Price, $7.50.

This is a detailed technical work, which tells how modern machine methods may be used to advantage wherever accounting is done on a large scale. The authors are members of the accounting firm of Lang, Schnakel & Company. The method followed has been to tell of the various machines available, what they may be used for and the proper way to use them to achieve the best results. While the book is not directed primarily at railroad accountants, much of the subject matter will probably be of interest and help to them.

Proceedings of the American Railway Engineering Association—Vol. 30, 1929. 6 in. by 9 in. 1,057 pages, illustrated. Bound in cloth. Published by the asociation, E. H. Fritch, secretary, 431 South Dearborn Street, Chicago.

The annual proceedings of the American Railway Engineering Association contain the reports of 24 standing committees and 4 special committees presented at the annual convention last March. Among the topics of special interest were the rail committee's report as to the cause and prevention of battered rail ends and their reconditioning after batter has occurred; the economic value of different sizes of rail, and the performance of the transverse fissure detector car which was placed in service during the past year. The report of the committee on Economics of Railway Operation included studies of methods of obtaining a more intensive use of existing facilities; methods of determining the most economical train lengths, and flat switch switching versus the hump method. The Committee on Economics of Railway Labor presented a report dealing with labor-saving devices in which were given performance data and cost records of various types of roadway machines.

A. R. E. A. Trackwork Plans. Portfolio, 9½ x 13 in. Bound in leather for loose-leaf insertion. Published by the Manganese Track Society, New York City. Price $10, refills, $8.

This is the 1929 edition of this important book, the first edition of which was issued about 10 years ago. It contains all of the plans and specifications for trackwork which have been passed on by the American Railway Engineering Association and published in its proceedings, including the plans adopted at the 1929 convention. The preparation of this book, which constitutes an outstanding achievement in association work in the railway field, has required a large amount of time and painstaking labor, since practically all of the plans which appeared in previous editions have been somewhat modified.

While the portfolio is of handy size for desk reference, the drawings are sharp and distinct and all of the details and dimensions which are shown on the original drawings made by the Track Committee of the A. R. E. A. are clearly legible. Copies of either the complete book, or of the refills only, can be secured from J. B. Strong, chairman, Manganese Track Society, 230 Park Ave., New York, or from E. H. Fritch, secretary, American Railway Engineering Association, 431 S. Dearborn St., Chicago.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Address on the O'Fallon Decision, by W. G. Brantley, delivered before Southern group valuation meeting, Washington, D. C., July 11, 1929. 26 p. Issued by Presidents' Conference Committee, Southern Group, Washington, D. C. *Apply.*

Bus Facts for 1929. "Growth of the Motor Bus compared with other transportation factors," p. 4-5. 47 p. Published by National Motor Bus Division, American Automobile Association, Washington, D. C. *Apply.*

Carnegie Beam Sections. This is a second edition dated November 1, 1928. It contains additions and modifications of the previous edition, covering tables of properties, allowable loads, etc. 46 pages. Pub. by Carnegie Steel Company, Pittsburgh, Pa.

The Effect of the O'Fallon Decision on Railroad Valuation and Rate Making, by Leslie Craven, an address before the Traffic Club of Chicago, July 10, 1929. 17 p. Issued by Presidents Conference Committee, Western Group, Chicago, Ill. *Apply.*

Foreign Trade Zones (or Free Ports), prepared by Board of Engineers for Rivers and Harbors, War Dept., and Bureau of Operation, U. S. Shipping Board, as their Miscellaneous Series bulletin no. 3. "Terminal facilities at European free ports," p. 40-42 322 p. Pub. by U. S. Govt. Print. Off., $1.00.

Pertaining to Transportation, compiled by Doris Rosenthal. A portfolio of 50 plates in black-and-white illustrating numerous and various methods of transportation. Quite decorative. Pub. by Brown-Robertson Co., Inc., New York City. $4.

Rhymes of the Sunrise Trail, by Si Tanhauser. A gay little book of poems by a station agent on the Long Island Railroad. "The Song of Transportation" on p. 24-26 is especially quotable, 47 p. Pub. by Parnassus, New York City. 35 cents (paper bound), $1.00 (cloth bound).

Rolling Tests of Plates, by Wilbur M. Wilson. A report on tests, made at the University of Illinois for the American Railway Engineering Association and with the collaboration of certain manufacturers, to develop data for the design of rollers for bridge expansion bearings and for rolling lift bridges. 60 p. Bulletin No. 191, Engineering Experiment Station, Urbana, Ill. 30 cents.

Report of the Research Director, Portland Cement Association. This is a bulletin of 210 pages that presents recently developed data on the making of concrete and a large amount of valuable information on the strength of concrete, in tabular and text form. Pub. by the association, 33 West Grand Avenue, Chicago.

Standard Specifications. Contains specifications for structural steel for buildings, bridges, locomotives, cars and for steel for other purposes, adopted by the Association of American steel manufacturers and the American Society for Testing Materials, 129 p. Pub. by Carnegie Steel Company, Pittsburgh, Pa.

Seven Place Natural Trigonometrical Functions, by Howard Chapin Ives. This is a compact, leather-bound pocket-book of 222 pages, of which 142 pages are devoted to tables and the balance to formulas and a brief summary of the principles of surveying. Pub. by John Wiley and Sons, New York City. $2.50 net.

Wages in the United States in 1928—Supplementing "Wages in the United States, 1914-1927" published April 1928. "Wages on Class I railroads" p. 35-41. 41 p. Pub. by National Industrial Conference Board, New York City, $1.00.

Periodical Articles

Air Passenger Schedules and Rates. Tables of sixty-six air lines and air-rail lines. Air Travel News, August, 1929, p. 57-65.

Attractive Western Carriers, by Richard J. Anderson. Discussion of recent developments in regard to the Rock Island and St. Louis-San Francisco railways. Financial World, August 7, p. 180.

Canadian Railway Pioneers, by Courtney Ryley Cooper. Discussion of present-day railway pioneering. World's Work, August, p. 72-76.

Coast to Coast Air-Rail Service. "Prominent airlines announce schedules co-ordinated with crack trains of the New York Central, Pennsylvania and Santa Fe." Air Travel News, August, 1929, p. 26-27.

Forty Stocks Favored by Corporation Heads, by Richard W. Schabacker. Response to questionnaire of Forbes Magazine, in respect to prospects of the stock market, including railroad stocks. Forbes, August 1, p. 17-18.

Investment Participation Offered in Railroad "Investment Trust," by Ward Gates. Discussion of the formation of a new corporation to invest in railroad securities. Magazine of Wall Street, July 27, 1929, p. 590-91, 640.

A New Railroad Development, by Frederick Hanssen. Concentration of common stocks of utility companies in holding companies. Financial World, July 31, p. 145, 167.

The Railroads and Passenger Air Transport, by Major C. E. McCullough. Co-ordination of rail and air transport. Air Travel News, August, 1929, p. 16-17, 77, 81.

Railway Terminal Air Rights Developments and the Movement of Local Land Values, by William D. Pence. This represents the result of an exhaustive study of the increase in land values on Manhattan Island for the purpose of deriving an accurate measure of the influence of the Grand Central improvements on the value of property within the affected area. It offers a method which may be applied to similar situations. Journal of Land and Public Utility Economics, May, 1929, p. 150-168.

What Is Back of the Rise in Rail Stocks, by Pierce H. Fulton. Recent stock developments in the railroad world. Magazine of Wall Street, July 27, p. 595-97, 644.

Wanted: An Unpractical Education, by John C. Parker. "I have little patience with the idea that subject-matter loses its cultural or education value merely because it is related to an honest world of affairs of physical fact and of live processes. On the contrary, a vital and vigorous education can come only through being related to life. My complaint would be rather that training youth to earn a living is not education at all; second, that a specific training may keep a youngster from earning the best kind of a living; and third, that it can't be done in school anyhow." p. 524, col. 1. Mechanical Engineering, July 1929, p. 524-526.

Looking Backward

One Hundred Years Ago

The Delaware & Hudson Canal Company on August 8, 1829, completed a private gravity railroad from its canal at Honesdale, Pa., to its mines at Carbondale, 16½ miles, and conducted a test run of the "Stourbridge Lion," the first steam locomotive to be tried out in this country for actual use. The locomotive was one of four imported from England and, after the test, was abandoned.

Fifty Years Ago

The International & Great Northern was sold at Austin, Tex., on July 31 and bought for $1,000,000 by interests representing the bondholders. The property includes 519 miles of road, upon which there were first mortgages amounting to $7,348,000.—*Railroad Gazette,* August 8, 1879.

A superintendent suggests that a great mistake is made in building freight cars with such stiff springs. The lack of elasticity subjects the track to very great wear from the jolting of heavily loaded cars, which a slight additional expense incurred in installing 30-in. elliptical springs in place of the present 20-in. springs would greatly diminish. The continual pounding of hundreds of wheels, each representing a weight often of three tons, will eventually tell upon the track.—*Railway Age,* August 7, 1879.

Twenty-Five Years Ago

The run made on July 20 by regular passenger train No. 25 on the Atlantic City Railroad of the Philadelphia & Reading [now the Reading] between Camden, N. J., and Atlantic City, 55.5 miles, showed the fastest time on record for the entire run, without a stop, and also, the highest speed ever reached by a steam locomotive—115.2 m.p.h., for 4.8 miles. No preparations were made for a special run and the train left Camden 4 min. late, reaching Atlantic City 43 min. later at an average speed of 77.4 m.p.h.—*Railway Age,* August 12, 1904.

The use of the Walschaert valve motion on the Baltimore & Ohio Mallet articulated locomotive and on the Pennsylvania's de Glehn four-cylinder compound, which are now on exhibition at the St. Louis World's Fair, has again brought the merits of this gear to the attention of American designers. These two locomotives represent extreme conditions as to the speeds for which they are intended. This would indicate that the Walschaert valve gear is well adapted to any kind of service—freight or passenger. It is fortunate that a well-designed gear of this type will soon be seen in this country.—*Railway Age,* August 12, 1904.

Ten Years Ago

Colonel Frederick W. Green, assistant to the president of the St. Louis Southwestern, has been appointed vice-president, with headquarters at St. Louis.—*Railway Age,* August 8, 1919.

The bill embodying the "Plumb plan" for government ownership and what labor pleases to call "democracy in the operation of the railroads," was introduced in the House on August 2.—*Railway Age,* August 8, 1919.

A strike of the 15,000 employees of the elevated and surface lines in Chicago on July 29 placed the burden upon six railroads of carrying 360,000 additional suburban passengers per day in 707 extra trains. The strike lasted four days and during that period these railroads handled a total of about 2,000,000 passengers in 4,300 trains, as compared to a normal total for four days of 520,000 passengers and 1,470 trains.—*Railway Age,* August 8, 1919.

Odds and Ends of Railroading

In connection with executive service records, James B. Yohe, who recently retired as vice-president and general manager of the Pittsburgh & Lake Erie, spent 59 years in railway service.

How many railways traverse graveyards? The only instance to our knowledge is on the Toledo division of the Baltimore & Ohio, at Cincinnati, where the line runs through Spring Grove cemetery for a distance of more than a mile.

A contributor remarks that the real reason for making up sleeping car berths, so that the passenger will lie with his head toward the engine, is to keep the dust out of the passenger's face when the windows are open.

Unusual Freight

A 40-ft. cruiser, fully equipped with furniture, linen, dishes and glassware, was recently shipped over the Pennsylvania from Wilmington, Del., to Chicago.

Long Railway Platforms

The London, Midland & Scottish has a platform at Manchester, England, that is 2,238 ft. long. The Bengal Nagpur at Khargpur, India, has one 2,350 ft. long. Are there any in this country that are longer?

Engineman-Dance Caller

An unusual sideline is that of A. F. Raders, engineman for the Illinois Central. He is an old-fashioned dance-caller of considerable fame and is in great demand for broadcasting and for old-time country dances. Despite the inroads of jazz, Raders maintains that the old-fashioned dances still enjoy a high degree of popularity.

Beats World's Champion

An unusual honor has come to H. C. Underwood, tariff compiler in the general freight office of the Illinois Central at Chicago. He defeated Doctor Alexander Alekhine, the world's chess champion, at his own game. True, the champion was playing a couple of dozen other games at the same time, but the achievement is a noteworthy one nonetheless, and Underwood is our candidate for railway chess champion.

Custer's Engineer

The pulling of General George A. Custer's train en route to that warrior's last battle was one of the historical episodes in the career of the late John T. Murphy, pensioned Illinois Central engineer, who died recently in Chicago. General Custer himself rode a considerable part of the way to Sioux City, Iowa, on the locomotive driven by Engineer Murphy, who had previously won honors and a purse of $200 by pulling passenger coaches out of danger during the great Chicago fire in 1871. The engineer's grandfather was a stonemason who helped build the first Illinois Central station in Chicago; his father worked on car trucks at Weldon Shops, Chicago; his son has been an engineer on the Chicago Terminal for 33 years, and his grandson was employed until recently in office work for the Illinois Central, making five generations that saw service on this one railroad. Engineer John T. Murphy himself was retired in 1913 after half a century in the service.

Stop Trains for Macaroni? Never!

There are reasons why railroads running out of Denver should permit stops in transit for partial unloading of carload shipments of agricultural implements, cement, stoneware, flour, bananas, malt and cereal beverages, but jams, jellies and macaroni—never. That is the substance of the decision recommended to the Interstate Commerce Commission by its examiners. The examiners explained that the policy of stopping carload shipments to unload partly at stations en route "was established years ago when the country was sparsely settled, the volume of freight was relatively light and freight service was less frequent and uncertain." The service was first extended to building material and agricultural implements to encourage settlement and tillage of the soil, it was explained, and later granted to other commodities for various reasons. Consumers of macaroni and jams and jellies would not be charged less than they now are if the transit stoppage privilege were granted, it was held. There was no explanation of how the privilege happened to be extended to bananas and withheld from macaroni.

A Railway Centenarian

At the age of 101 years, Moses Barnhart of Cypress, Ill., is probably the oldest former worker of the Illinois Central. Mr. Barnhart was a member of one of the construction gangs engaged in building the charter lines of the I. C. in Illinois more than 70 years ago. He worked with a wheelbarrow on the main-line grade between what are now the sites of Anna and Dongola, Ill. His pay was one dollar a day, and when the job was done he left without even waiting to see the rails laid or the coming of the first train. Later he took up farming, paying $1.50 an acre for his land.

There Are Stations and Stations

Ben Halstead of Danville, Ill., much in a hurry, raced into the Englewood police station at Chicago recently. He sped past the sergeant's desk like a star out of a Roman candle.

"Can't wait for a ticket," he shouted to the sergeant, who gazed at him agape. Mr. Halstead raced down the corridor to the door leading to the cell block.

"I gotta make the 9:16," he gasped as he neatly straight-armed the lock-up keeper, Joe Condon, and plunged into a cell. Condon slammed the cell door shut and went out to the sergeant to inquire into this strange proceeding. After a while it came out. Halstead, bored by Chicago, was intent upon getting back to Danville. He asked a pedestrian the way to the Englewood station. He neglected to say which station, so the pedestrian pointed out the police station.

"It was my fault," he told the police sergeant in parting, "I should have said depot."

More Boomer Language

DENVER, COLO.

TO THE EDITOR:

I read, with considerable pleasure, the article entitled, "Railroad Talk"; in your issue of June 22.

Many years ago, when I was employed by the passenger department of the Pennsylvania, we were known by the picturesque term of "body-snatchers". Before I became a railroad employee, I was accustomed to hearing section laborers called "paddies", probably because most of them, at that time, were Irish.

CHARLES C. BOGGS.

WARREN, OHIO.

TO THE EDITOR:

May I add a few to the list of terms contained in your issue of June 22:

Engineer	Fog eater
Fireman	Smoke agent
Head brakeman	Smokestack
Telegraphers (3rd trick)	Owls
Caboose	Hut
Throw a switch	Bend the iron

R. N. FISK.

NEWARK, N. J.

TO THE EDITOR:

May I contribute the following to the railroad terms:

Switchman	Dolly flapper
Locomotive with large drivers	High boy
Locomotive with small drivers	Ground hog
Switching locomotive with sloping tender	Bob tail
Ore car	Jimmy
Trainman's shanty	Dunnagin
Work train	Mud hen
Commuters' train	Jit
Relieving a crew after 16 hours	Dog-catching

HARRY COTTERELL.

THE CHICAGO, ROCK ISLAND & PACIFIC, in conjunction with 19 cities and towns in Arkansas, Oklahoma and Texas, has organized to combat the malaria mosquito, following the unusual wet weather which has visited nearly all sections of the southwest this summer. The campaign is being carried out throught the medical and operating departments of the railroad. The measures employed include the use of oil and, where the nuisance is particularly bad, provide for draining on an extensive scale. The work on the ground is under the direction of H. W. VanHovenberg, consulting sanitary engineer of the Rock Island and his assistants.

TWENTY-SEVEN THOUSAND EMPLOYEES of the Pennsylvania have just completed their payments on shares of the company's stock which they bought under the plan promulgated by the company last year; and they now take their places as full-fledged stockholders of the company. This stock is now paying dividends at the rate of eight per cent per annum. About 66,000 other employees, who have bought stock and who are paying on installments, have not yet completed their purchases. The railroad company offers to employees who have not the facilities of a safe deposit box, the privilege of keeping the stock certificates in the vaults of the company without charge.

Eight-Hour Day for Trackmen

The Pennsylvania, following conferences between officers of the road and a committee of the Pennsylvania System Fraternity, has arranged for the eight-hour day, beginning August 16, for all track employees. This includes not only foremen and laborers, but track walkers, carpenters and plumbers. For work over eight hours in any one day, time and one-half will be allowed.

Wage Statistics for May

The Interstate Commerce Commission reports the total number of persons in the service of Class I railways as of the middle of May, 1929, as 1,714,389; total compensation for the month, $250,745,324. The comparison with May of last year shows an increase of 0.27 per cent in the number of employees and an increase of 3.24 per cent in compensation received by them.

In maintenance of way and structures there is a slight increase in the number of employees, as compared with last year, and also in train and engine service. In maintenance of equipment and stores there is a decrease. Other departments show slight changes.

Novel L. & N. Safety Bulletin

A unique safety bulletin board, which shows, at a glance, whether injuries are increasing or decreasing, has been erected in the South Louisville boiler shop of the Louisville & Nashville. The board, which was designed and erected by C. Reynolds, foreman of the boiler shop layout gang, quickly attracts attention, and it imparts the shop's safety standing at a glance.

Except for the operation of the lights, the accompanying photograph explains itself to the reader. The green light glows continuously unless there is a reportable injury, at which time the green light is cut out and the red light burns the rest of the month. On the first day of the following month, however, the red light is cut out and the green light glows again and continues to shine until there is another reportable injury.

In case of injuries not reportable to the government, the yellow light of caution glows as a warning that something is wrong. This yellow light burns until the first of the next month. If the green light is burning and a non-reportable injury occurs, the yellow light glows along with the green.

The safety activities in this shop have made decided improvement in the personal injury situation. In 1927 the shop averaged 18 injuries a month while in 1928 this average was cut to 2.5 injuries, and thus far in 1929 the average is 1.2 injuries. Between 3,000 and 4,000 men are employed and the number of man-hours worked is 600,000 a month. In 1928 the employes worked an average of 242,676 man-hours per injury.

As a result of special no-accident drives

Safety Record Shown at a Glance

this shop went through the months of November, 1928, and May, 1929, without a reportable injury.

Condition of Locomotives and Cars

Class I railroads on July 15 had 8,225 locomotives in need of repairs or 14.3 per cent of the number on line, as reported by the Car Service Division of the American Railway Association; an increase of 772 compared with July 1, at which time there were 7,453 or thirteen per cent, the lowest number in need of repairs ever reported. Class I railroads on July 15 had 5,414 serviceable locomotives in storage, compared with 5,411 on July 1.

On the 15th 145,411 freight cars were in need of repairs, equal to 6.5 per cent of the number on line. This was an increase of 3,347 cars above the number reported on July 1.

Great Northern Relinquishes Control of Motor Coach Lines

Control of the Northland Transportation Company has been sold by the Great Northern to the Motor Transit Corporation and Automotive Investments, Inc., which are affiliated with the motor coach system of the Greyhound Lines. The coaches will be operated as the Northland Greyhound Lines.

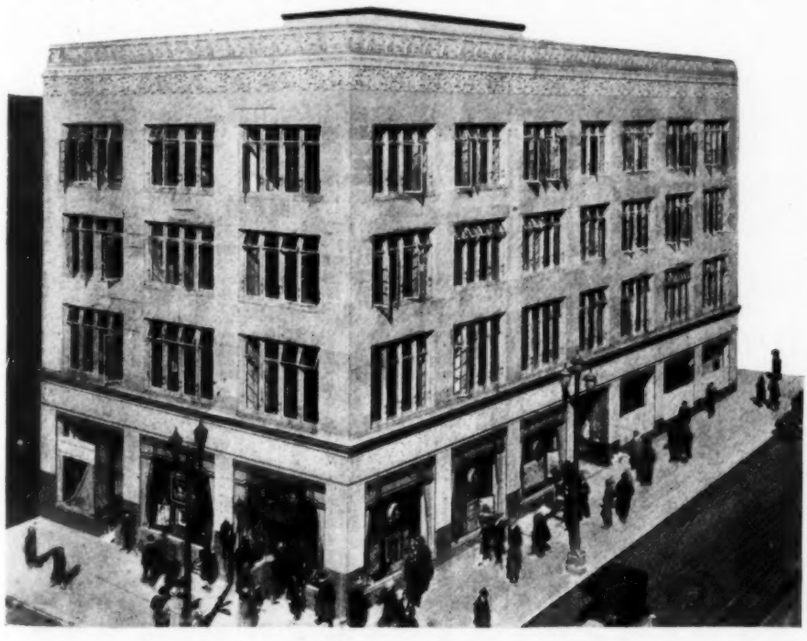
The Great Northern will retain a large minority interest in the motor coach company and will be represented on its board of directors. In conformity with the national policy of the Greyhound system, the Northland Greyhound Lines will co-operate with the railway by providing service which will supplement train service.

The Northland Transportation Company was formed in 1924 by consolidating several small lines. It was acquired by the Great Northern early in 1925, and since then has been expanded until its lines form an extensive network in Great Northern territory in Minnesota.

Ticket Office Interior Which Harmonizes With Oriental Limited Decorative Scheme

Great Northern Opens New Office Building at Seattle

The Great Northern has opened in its new four-story office building in the business district of Seattle, Wash., a ticket office and information bureau which has incorporated as one of its features individual tables and desks where patrons may be seated and have itineraries of their trips arranged without the distractions which so often attend the transaction of business when standing at a counter. The city ticket office is given an air of spaciousness by a ceiling 16 ft. in height. The general color note of the room is a pastel shade of green symbolical of the decorative scheme of the railroad's Oriental Limited. The attractiveness is enhanced by the use of luxurious and harmonious furnishings. The second and third floors of the building are used by the freight and passenger traffic and the export and import departments and the executive, agricultural development and legal departments.



New Great Northern Office Building at Seattle, Wash.

"Lightning Flash" Crossing Signal

The "lightning flash" highway crossing signal, made by Dominion International Equipments, Ltd., Ottawa, Canada, has been installed in Niagara Falls, Ont., at a number of crossings of the Michigan Central—25 signals in all; and to celebrate the completion of the installation the city, on July 30, held a "safety day" with public ceremonies, including a banquet, largely attended. Addresses were made by Hon. T. C. Norris, member of the board of railway commissioners for Canada, Hon. George S. Henry, minister of highways for Ontario, and others.

The "lightning flash" signal has been in use for some time at a crossing near Hull, Quebec, and a picture of it was shown in the *Railway Age* of May 4 last, page 1066. The light, the shape of the conventional flash of lightning and about 4 ft. long, is produced by neon tubes.

Arizona Train-Limit Law

The Atchison, Topeka & Santa Fe and the Southern Pacific filed pleas in the United States District Court at Los Angeles, Cal., on July 24 for an injunction to restrain the enforcement of the Arizona train limit law. A hearing on the motions will be held on September 30.

In these actions, which are directed against K. Berry Peterson, attorney general of Arizona, the railroads seek to have set aside the state law passed in 1912 which prohibits the operation in Arizona of freight trains of more than 70 cars, exclusive of the caboose, and passenger trains of more than 14 cars. In the bills of complaint the Santa Fe estimates that the net annual saving in freight train operation through annul-

(Continued on page 400)

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Akron, Canton & Youngstown	June	171	$337,133	$167	$355,190	$38,964	$22,948	$14,762	$78,867	$19,900	$175,441	49.4	$179,749	$154,921	$121,946	$61,820
	6 mos.	171	1,931,017	846	2,004,851	236,070	165,794	82,928	474,640	106,511	1,064,365	53.1	940,486	806,073	598,587	289,283
Atchison, Topeka & Santa Fe	June	9,392	12,095,795	3,513,475	19,322,445	2,860,492	3,265,633	413,280	4,871,597	453,379	11,821,602	61.1	7,510,843	5,813,356	5,783,422	1,891,619
	6 mos.	9,392	73,071,205	17,801,164	102,125,229	15,980,981	19,866,064	2,472,116	29,348,029	2,718,856	70,318,580	68.9	31,806,649	23,176,412	23,515,823	12,826,615
Gulf, Colorado & Santa Fe	June	1,944	1,617,951	184,579	2,110,202	558,361	437,874	56,849	632,494	76,576	1,748,973	82.9	361,229	268,823	158,075	15,052
	6 mos.	1,944	10,666,047	1,030,420	12,720,883	3,228,147	2,630,758	337,085	4,097,959	442,884	10,660,073	83.8	2,060,810	1,515,370	872,416	423,192
Panhandle & Santa Fe	June	1,104	870,729	93,639	1,154,441	211,763	212,154	13,515	311,082	30,475	773,587	67.0	380,854	342,961	254,429	—126,302
	6 mos.	1,051	5,176,834	541,024	6,260,440	1,432,880	1,170,080	73,712	1,811,055	164,691	4,625,972	73.9	1,634,468	1,395,368	933,540	—1,049
Atlanta & West Point		93	150,657	53,986	236,180	38,779	42,635	12,729	87,833	13,997	200,450	84.9	35,730	22,602	10,892	12,444
	6 mos.	93	951,833	293,340	1,447,186	183,304	256,622	75,120	561,716	83,556	1,188,031	82.1	259,155	174,509	98,409	161,805
Western of Alabama	June	133	154,342	55,584	233,748	47,016	46,734	12,897	78,119	13,223	201,833	86.3	31,915	16,622	23,742	35,466
	6 mos.	133	1,017,036	314,263	1,495,518	271,377	300,409	76,694	506,734	83,984	1,263,288	84.5	232,230	143,587	157,376	431,530
Atlanta, Birmingham & Coast	June	639	341,341	23,099	402,930	83,916	78,887	30,358	154,749	18,730	378,473	93.9	24,457	7,657	—6,498	—49,808
	6 mos.	639	1,931,053	121,009	2,304,687	526,145	494,671	173,340	932,030	112,993	2,304,263	100.0	424	—100,747	—180,300	—181,342
Atlantic Coast Line	June	5,152	4,423,407	735,085	5,703,012	884,759	1,202,784	161,424	1,978,302	178,678	4,436,300	77.8	1,266,712	813,402	746,289	353,143
	6 mos.	5,150	31,200,629	7,884,654	42,841,515	5,325,170	6,931,275	1,006,556	13,260,233	1,071,715	27,996,213	65.3	14,845,302	11,131,775	10,416,663	6,437,114
Charleston & Western Carolina	June	342	238,147	9,414	257,046	58,132	39,896	8,180	90,283	8,137	204,628	79.6	52,418	25,918	22,609	15,929
	6 mos.	342	1,576,501	58,000	1,700,481	369,461	229,957	43,456	589,477	41,723	1,274,067	74.9	426,414	282,389	260,972	192,246
Baltimore & Ohio	June	5,639	17,836,158	2,056,847	21,282,674	2,328,722	4,604,403	522,359	6,830,388	692,061	15,179,570	71.3	6,103,104	5,069,512	4,788,077	4,293,969
	6 mos.	5,639	100,322,685	11,035,743	119,294,952	13,972,399	25,765,216	2,982,397	41,230,459	4,119,060	89,172,060	74.8	30,122,892	23,941,148	22,490,840	17,712,360
Baltimore & Ohio Chic. Term	June	82	.....	.....	398,161	32,999	48,254	2,413	181,478	17,210	285,110	71.6	113,051	45,553	147,830	103,626
	6 mos.	82	.....	.....	2,192,730	253,608	280,169	14,144	1,103,085	107,245	1,785,869	81.4	406,861	37,430	638,658	616,211
Staten Island Rapid Transit	June	23	111,171	152,545	277,571	41,227	18,273	2,063	105,458	15,241	182,262	65.7	95,309	78,303	43,321	38,025
	6 mos.	23	631,450	750,404	1,455,686	195,323	110,670	12,494	635,769	92,263	1,046,519	71.9	409,167	303,150	83,583	86,194
Bangor & Aroostook	June	619	361,932	30,457	558,668	119,026	148,538	4,858	122,061	25,342	421,192	75.4	137,476	92,680	132,652	67,671
	6 mos.	619	3,619,292	324,034	4,241,422	636,816	733,638	35,843	1,009,877	168,241	2,599,239	61.3	1,642,183	1,299,022	1,359,440	1,266,627
Belt Ry. Co. of Chicago	June	48	.....	.....	690,433	92,028	69,614	3,457	288,702	14,449	468,250	67.8	222,183	159,591	144,695	148,844
	6 mos.	48	.....	.....	4,030,965	426,033	453,175	23,072	1,882,302	94,862	2,879,444	71.4	1,151,521	814,114	896,318	870,599
Bessemer & Lake Erie	June	227	2,128,814	5,635	2,169,114	153,603	324,113	13,841	372,041	36,827	903,031	41.6	1,266,083	1,210,951	1,214,359	960,458
	6 mos.	227	7,405,316	44,770	7,596,463	643,336	1,925,691	87,529	1,805,973	215,297	4,643,977	61.1	2,952,486	2,606,107	2,808,956	1,325,907
Bingham & Garfield	June	33	46,820	.....	49,252	11,182	7,130	1,495	11,325	4,500	35,737	72.6	13,515	5,884	23,343	11,462
	6 mos.	33	272,439	.....	287,385	45,962	27,054	9,462	63,435	26,764	173,647	60.4	113,738	24,958	127,755	86,438
Boston & Maine	June	2,077	4,252,493	1,256,352	6,389,703	1,204,156	1,039,121	93,086	2,115,589	220,859	4,701,483	73.6	1,688,220	1,366,459	1,124,724	1,036,788
	6 mos.	2,077	25,119,760	7,630,448	37,669,995	6,190,179	6,676,268	538,453	13,373,709	1,305,922	28,192,176	74.8	9,477,819	7,607,376	6,298,024	6,108,006
Brooklyn Eastern Dist. Term	June	11	116,909	.....	119,482	5,530	19,581	643	43,169	6,504	75,427	63.1	44,055	38,001	38,001	44,168
	6 mos.	11	710,552	.....	726,245	53,040	79,754	4,400	254,167	39,736	431,097	59.4	295,148	249,032	249,032	251,811
Buffalo & Susquehanna	June	253	116,433	759	131,889	28,643	50,492	1,622	40,735	7,545	129,037	97.8	2,852	752	13,239	19,884
	6 mos.	253	830,346	6,297	900,596	170,535	297,218	10,871	274,812	46,958	800,394	88.9	100,202	106,695	200,896	101,681
Buffalo, Rochester & Pittsburgh	June	601	1,387,251	64,940	1,584,975	215,203	499,349	32,256	520,266	42,981	1,312,098	82.8	272,877	222,517	249,561	230,511
	6 mos.	601	7,946,483	410,398	8,718,130	923,421	2,560,092	197,237	3,142,158	269,365	7,102,315	81.5	1,615,815	1,355,145	1,485,787	1,467,574
Canadian Pacific Lines in Maine	June	233	108,199	30,738	151,411	56,897	40,331	7,980	77,574	4,156	186,938	123.4	—35,527	—50,027	—72,877	—67,364
	6 mos.	233	1,474,498	198,778	1,750,128	359,006	353,651	41,629	767,430	24,475	1,546,191	88.3	203,937	116,937	—50,979	—51,547
Canadian Pacific Lines in Vermont	June	85	132,848	36,948	200,257	46,649	27,938	1,916	90,280	2,272	169,055	84.4	31,202	27,182	—9,276	—91,887
	6 mos.	85	713,272	195,988	1,046,558	229,695	196,857	10,954	571,767	13,984	1,022,911	97.8	23,647	—473	—197,325	—507,888
Central of Georgia	June	1,944	1,516,486	275,935	1,978,938	302,619	376,158	75,952	767,337	86,624	1,621,178	81.9	357,760	230,768	237,394	191,623
	6 mos.	1,944	9,384,252	1,856,566	12,543,978	1,733,375	2,183,406	429,573	4,699,561	531,221	9,670,356	77.1	2,873,622	2,104,837	2,105,361	1,983,826
Central New Jersey	June	690	3,516,304	788,970	4,726,170	502,967	967,669	66,046	1,756,905	127,689	3,447,807	73.0	1,278,363	781,159	658,581	585,881
	6 mos.	690	21,974,584	4,095,966	28,074,749	2,693,759	6,269,521	355,602	10,773,409	782,952	21,055,568	75.0	7,019,181	4,771,651	3,888,206	4,207,444
Central Vermont	June	413	616,504	112,088	819,711	215,612	99,457	19,163	291,126	27,129	654,286	79.82	165,425	151,427	113,887	—159,387
	6 mos.	413	3,291,357	580,660	4,309,701	793,630	582,618	105,744	1,745,678	151,810	3,391,817	78.70	917,884	822,977	814,217	—1,639,263
Chesapeake & Ohio	June	2,731	9,375,259	570,632	10,390,734	1,555,629	2,333,508	133,901	2,571,716	312,405	6,920,179	66.6	3,470,555	2,770,319	3,017,338	2,956,966
	6 mos.	2,730	56,293,252	3,193,486	61,983,731	9,253,845	14,105,922	809,191	15,983,675	1,717,950	41,993,339	67.7	19,990,392	15,808,936	16,972,845	14,745,477
Chicago & Alton	June	1,028	1,637,518	467,381	2,353,601	298,873	526,908	79,142	821,262	57,745	1,798,462	76.4	555,139	440,203	267,864	173,379
	6 mos.	1,028	9,748,159	2,750,812	13,951,760	1,484,202	3,195,826	457,509	5,253,145	366,468	10,854,718	77.8	3,097,042	2,434,672	1,404,055	841,669
Chicago & Eastern Illinois	June	946	1,562,282	282,214	2,013,837	291,299	433,080	82,592	749,385	77,473	1,645,410	81.7	368,427	237,429	84,424	138,673
	6 mos.	946	9,430,549	1,655,004	12,151,821	1,531,407	2,571,917	497,808	4,696,371	430,682	9,815,329	80.8	2,336,492	1,580,573	682,222	354,629
Chicago & Illinois Midland	June	131	203,004	4,345	214,988	43,142	52,765	17,843	62,179	17,115	192,853	89.7	22,135	14,200	16,395	22,912
	6 mos.	131	1,360,401	36,269	1,441,204	202,249	325,863	110,804	409,532	109,615	1,157,566	80.3	283,638	236,028	233,852	216,363
Chicago & Northwestern	June	8,466	9,648,364	2,372,734	13,601,450	1,961,350	2,409,102	251,240	4,498,148	390,681	9,592,630	70.5	4,008,820	3,233,287	3,075,698	3,068,197
	6 mos.	8,466	52,064,230	11,861,378	72,091,523	9,931,904	14,408,817	1,264,391	28,080,101	2,278,485	56,369,994	78.2	15,721,529	11,063,167	9,922,930	9,054,094

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Chicago, Burlington & Quincy	June	9,374	$9,369,090	$1,717,859	$12,475,796	$2,648,485	$1,991,749	$352,359	$4,057,834	$368,527	$9,556,002	76.6	$2,919,794	$1,830,544	$1,564,466	$1,373,812
	6 mos.	9,374	59,370,998	8,785,767	76,227,002	10,585,014	11,890,043	1,730,614	25,643,628	2,230,748	52,421,105	68.8	23,805,897	17,305,895	16,034,348	13,290,172
Chicago Great Western	June	1,495	1,643,933	239,670	2,097,591	333,871	386,027	90,023	802,141	55,253	1,665,370	79.4	432,221	354,293	184,491	166,248
	6 mos.	1,495	9,597,421	1,410,793	12,059,213	1,514,480	2,259,642	500,384	5,213,579	347,014	9,892,407	82.0	2,166,806	1,682,076	662,491	780,627
Chicago, Indianapolis & Louisville	June	650	1,127,520	164,920	1,598,323	169,711	325,984	40,160	506,632	36,124	1,090,779	68.2	507,544	406,622	283,544	205,100
	6 mos.	650	6,939,695	1,001,486	9,033,150	869,689	1,887,039	242,049	3,249,776	221,496	6,557,425	72.6	2,475,725	1,956,448	1,181,369	1,168,126
Chicago, Mil., St. Paul & Pacific	June	11,247	11,528,593	1,568,996	14,583,155	3,323,892	2,522,079	341,733	4,773,572	390,745	11,431,496	78.4	3,151,659	2,561,735	2,089,496	1,510,839
	6 mos.	11,249	64,518,244	8,209,793	80,882,124	12,793,102	15,507,425	1,873,076	29,945,293	2,264,014	62,777,755	77.6	18,104,369	13,507,847	10,627,564	11,770,176
Chicago River & Indiana	June	20	.....	.....	571,547	46,920	53,219	320	204,770	15,202	320,431	56.1	251,116	212,618	297,464	248,833
	6 mos.	20	.....	.....	3,469,631	277,030	322,671	3,516	1,276,244	89,341	1,968,802	56.7	1,500,829	1,259,108	1,767,018	1,610,131
Chicago, Rock Island & Pacific	June	7,564	8,322,217	1,566,341	11,010,940	1,692,463	2,188,069	274,631	3,995,904	348,608	8,531,970	77.5	2,478,970	1,804,064	1,329,696	1,603,878
	6 mos.	7,564	50,302,207	9,340,701	65,893,597	9,114,465	13,436,283	1,548,548	24,702,236	2,128,227	51,476,613	78.1	14,416,984	10,261,066	7,613,892	8,488,616
Chicago, Rock Island & Gulf	June	550	526,161	64,169	634,860	68,087	65,617	23,292	211,801	17,710	387,865	61.1	246,995	220,132	180,450	24,791
	6 mos.	527	2,927,952	391,425	3,620,395	389,183	363,211	126,050	1,198,795	112,775	2,205,112	60.9	1,415,283	1,262,204	1,047,990	589,048
Chicago, St. Paul, Minn. & Omaha	June	1,746	1,606,947	384,762	2,187,065	343,431	406,557	40,927	863,380	81,129	1,747,998	79.9	439,067	334,776	288,191	37,632
	6 mos.	1,746	9,338,009	2,012,203	12,404,093	1,684,257	2,345,814	236,543	5,598,961	487,649	10,418,950	84.0	1,985,143	1,344,009	994,574	797,156
Clinchfield Railroad	June	309	490,421	14,796	515,419	59,674	142,111	22,123	110,072	16,873	350,568	68.0	164,851	89,844	132,653	171,734
	6 mos.	309	3,340,611	84,417	3,497,773	373,474	868,546	133,747	719,480	109,048	2,204,466	63.0	1,293,307	843,191	1,303,551	1,306,470
Colorado & Southern	June	1,035	656,687	105,030	850,093	259,015	222,272	19,320	300,336	40,388	844,243	99.3	5,850	—62,636	—84,179	—23,212
	6 mos.	1,035	4,577,181	508,117	5,600,388	914,022	1,264,325	95,321	2,002,672	253,456	4,552,962	81.3	1,047,426	624,555	499,132	356,285
Ft. Worth & Denver City	June	696	635,129	150,379	849,832	174,525	180,068	26,264	278,928	39,374	701,331	82.5	148,501	107,087	81,194	129,084
	6 mos.	696	4,154,664	794,160	5,347,810	792,734	964,337	136,725	1,708,556	240,180	3,861,851	72.2	1,485,959	1,194,149	1,128,125	1,248,055
Wichita Valley	June	271	73,769	7,933	87,604	23,011	8,784	6	35,953	1,530	67,767	77.4	19,837	12,993	—8,795	—21,805
	6 mos.	271	581,754	52,267	669,881	131,251	49,680	127	230,828	10,017	419,284	62.6	250,597	205,962	77,942	171,430
Columbus & Greenville	June	167	97,270	14,335	133,199	34,937	16,025	3,652	46,492	11,428	112,534	84.5	20,665	16,631	7,055	—18,937
	6 mos.	167	711,331	95,940	870,301	213,896	106,020	22,668	314,823	71,164	728,567	83.7	141,734	121,399	53,490	1,125
Conemaugh & Black Lick	June	23	133,580	.....	214,138	18,052	30,645	973	101,583	3,700	154,953	72.4	59,185	58,185	58,942	32,412
	6 mos.	23	549,700	.....	1,041,367	91,725	174,755	3,437	580,333	20,449	870,699	83.6	170,668	164,668	157,645	19,074
Delaware & Hudson	June	881	2,851,454	241,535	3,476,283	441,325	755,115	52,336	1,232,521	165,430	2,657,033	76.4	819,250	729,776	713,727	315,677
	6 mos.	881	17,084,692	1,425,354	20,012,604	2,458,258	4,789,244	327,241	7,495,632	978,229	16,089,782	80.4	3,922,822	3,387,691	3,352,586	2,628,071
Delaware, Lackawanna & Western	June	998	4,822,329	957,434	6,622,192	726,959	1,138,949	154,316	2,526,563	175,891	4,749,023	71.7	1,873,169	1,322,905	1,312,843	1,395,654
	6 mos.	998	30,168,516	5,388,162	40,478,214	3,898,713	7,252,764	862,841	15,911,953	1,073,680	29,227,175	72.2	11,251,039	7,870,287	7,885,394	6,943,475
Denver & Rio Grande Western	June	2,563	1,897,882	369,985	2,743,452	599,856	546,842	67,675	725,827	93,174	2,093,296	76.3	650,156	485,125	565,563	354,682
	6 mos.	2,553	12,553,354	1,506,009	15,474,064	2,577,006	3,186,812	371,039	4,555,949	543,672	11,428,033	73.9	4,046,031	3,013,508	3,469,441	2,360,138
Denver & Salt Lake	June	232	177,325	14,859	212,134	120,157	58,173	2,559	37,511	12,117	229,487	108.2	—17,353	—27,353	—19,291	38,671
	6 mos.	232	1,460,338	112,054	1,677,560	374,060	408,877	12,296	280,433	75,047	1,147,832	68.4	529,728	469,709	517,944	557,153
Detroit & Mackinac	June	273	162,008	9,021	199,801	33,681	26,219	2,023	41,141	6,334	108,162	54.1	91,639	82,132	82,344	26,399
	6 mos.	296	662,352	62,671	797,278	143,014	181,307	13,224	248,116	37,870	608,218	76.3	189,060	142,699	155,240	69,451
Detroit & Toledo Shore Line	June	50	369,292	.....	374,966	50,093	32,925	49,265	92,921	25,651	250,855	66.9	124,111	91,390	34,486	54,866
	6 mos.	50	2,705,205	.....	2,752,609	237,214	216,799	171,382	643,537	102,785	1,371,715	49.8	1,380,894	1,158,409	620,530	626,021
Detroit Terminal	June	19	.....	.....	212,084	24,585	17,364	.....	90,938	4,227	137,114	64.7	74,970	53,621	52,734	57,245
	6 mos.	19	.....	.....	1,459,866	137,151	127,786	1	621,965	26,607	913,510	62.6	546,356	417,519	421,901	295,080
Detroit, Toledo & Ironton	June	495	1,207,765	3,215	1,245,944	175,100	233,493	12,140	277,131	37,568	734,362	58.9	511,582	459,863	370,870	136,850
	6 mos.	495	7,431,713	18,631	7,617,699	864,881	1,037,274	74,657	1,759,925	182,395	3,911,433	51.3	3,706,266	3,275,056	2,693,847	717,424
Duluth & Iron Range	June	269	932,059	3,139	1,077,582	137,940	99,411	1,557	186,865	25,688	451,243	41.9	626,339	553,453	552,394	516,377
	6 mos.	269	2,430,239	27,731	2,819,815	578,614	665,902	9,759	754,685	133,762	2,142,504	76.0	677,311	474,853	475,750	—42,348
Duluth, Missabe & Northern	June	305	2,737,946	3,599	3,108,900	197,497	190,077	2,732	386,685	25,397	802,388	25.8	2,306,512	1,970,630	1,969,167	1,806,238
	6 mos.	307	6,548,766	23,798	7,464,610	768,474	1,107,814	17,781	1,411,453	138,054	3,443,454	46.1	4,021,156	2,979,690	2,963,814	1,218,296
Duluth, Winnipeg & Pacific	June	178	209,940	15,605	235,864	62,529	46,728	5,021	70,679	8,161	196,706	83.8	39,158	27,157	24,474	—846
	6 mos.	178	1,144,776	76,307	1,273,586	264,978	243,569	29,481	441,497	49,054	1,045,383	82.1	228,203	163,302	166,808	154,888
Elgin, Joliet & Eastern	June	453	2,047,867	19	2,253,649	229,993	370,028	15,153	748,913	55,485	1,418,264	62.9	835,385	693,758	507,149	360,166
	6 mos.	453	12,231,982	62	13,448,989	1,177,258	2,297,371	91,347	4,644,606	316,183	8,522,031	63.4	4,926,958	4,155,408	2,959,959	2,503,107
Erie Railroad	June	2,047	7,331,788	950,742	9,336,366	1,244,153	2,252,811	210,834	3,415,202	312,914	7,485,081	80.2	1,851,285	1,425,263	1,428,999	1,283,635
	6 mos.	2,047	45,883,923	4,888,573	55,638,278	6,174,667	13,103,514	1,100,257	21,138,593	1,813,506	43,599,750	78.4	12,038,528	9,396,410	9,114,434	7,365,021
Chicago & Erie	June	269	1,022,212	73,736	1,239,003	200,792	145,809	33,654	327,856	43,220	749,652	60.5	489,351	433,153	141,547	166,960
	6 mos.	269	6,807,766	277,717	7,739,492	886,831	815,184	179,417	2,149,654	253,492	4,281,871	55.3	3,457,621	3,119,870	1,366,363	612,515
New Jersey & New York	June	45	24,251	100,056	135,141	16,886	16,785	1,809	64,358	3,590	103,427	76.5	31,714	27,605	—6,429	—20,646
	6 mos.	45	162,212	569,085	769,184	92,206	140,088	10,575	415,755	21,796	680,395	88.5	88,789	64,124	—132,605	—153,152
N. Y., Susquehanna & Western	June	131	313,671	43,477	409,322	63,795	54,858	5,331	184,641	12,249	320,807	78.4	88,815	57,461	36,171	—5,126
	6 mos.	131	2,044,461	253,586	2,526,514	310,049	317,219	31,736	1,150,304	71,642	1,880,851	74.4	645,663	458,800	308,387	126,634

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Evansville, Indianap. & Terre Haute	June	146	$128,052	$3,216	$138,774	$28,006	$16,364	$1,766	$41,200	$4,498	$91,834	66.2	$46,940	$41,188	$11,852	—$25,127
	6 mos.	146	946,782	20,890	1,009,270	143,634	124,195	11,693	340,660	30,709	650,711	64.5	358,559	327,256	120,763	20,059
Florida East Coast	June	857	486,930	176,723	781,151	140,519	160,537	25,896	260,007	45,489	638,978	81.8	142,173	—6,466	—104,581	25,644
	6 mos.	854	4,533,738	2,939,093	8,576,989	955,930	1,074,498	186,306	2,200,955	290,976	4,862,266	56.7	3,714,723	2,848,235	2,351,456	1,951,813
Fort Smith & Western	June	249	80,279	8,210	107,394	25,334	21,590	5,643	32,743	7,556	92,448	86.1	14,946	10,226	1,182	—11,328
	6 mos.	249	589,206	53,308	700,389	144,784	146,921	35,831	237,741	43,901	605,756	86.5	94,633	66,263	10,006	—40,406
Galveston Wharf	June	13	.....	.....	137,057	44,792	4,969	4,410	29,493	7,257	105,343	76.9	31,714	14,714	14,990	116,929
	6 mos.	13	.....	.....	996,053	255,391	31,769	25,275	191,187	39,213	636,671	63.9	359,382	257,382	257,265	268,730
Georgia R. R.	June	328	328,429	59,351	418,143	50,874	85,030	23,051	173,274	23,240	355,718	85.0	62,425	52,739	65,623	57,576
	6 mos.	328	2,108,373	318,277	2,631,322	295,106	503,699	136,046	1,102,603	144,287	2,182,465	82.9	448,857	381,120	451,046	367,334
Georgia & Florida	June	502	123,421	12,012	144,288	28,293	20,373	10,427	66,657	8,192	134,152	93.0	10,136	432	1,707	9,384
	6 mos.	502	671,200	58,292	791,284	160,012	129,954	60,155	342,583	51,383	735,165	92.9	56,119	—2,157	22,802	78,828
Grand Trunk Western	June	345	1,597,945	210,900	1,927,244	389,763	398,885	46,586	634,964	66,271	1,527,092	79.2	400,152	306,312	182,780	317,296
	6 mos.	345	9,898,112	988,707	11,476,360	1,532,432	2,298,609	269,658	3,869,880	397,635	8,586,157	73.1	3,090,203	2,533,911	1,824,380	1,658,926
Atlantic & St. Lawrence	June	166	158,775	19,722	199,370	80,022	43,964	6,401	101,736	11,573	245,181	122.9	—45,811	—60,471	—110,244	—80,832
	6 mos.	166	860,305	148,834	1,131,922	335,294	262,173	36,439	594,397	51,693	1,289,900	113.9	—157,978	—251,981	—567,550	—674,621
Chic., Det. & Canada Gr. Tr. Jct.	June	59	298,139	721	335,369	18,621	14,372	4,604	94,886	3,614	137,111	40.9	198,258	186,996	155,632	191,078
	6 mos.	59	1,837,917	4,041	2,115,028	112,886	95,268	28,949	600,151	22,964	860,173	40.7	1,254,855	1,187,930	1,001,343	892,129
Detroit, Grand Haven & Mil.	June	192	779,958	23,648	849,650	102,251	59,891	14,116	280,121	17,994	465,787	54.8	383,863	368,868	232,729	126,722
	6 mos.	192	4,331,642	142,386	4,781,974	402,721	386,238	85,505	1,761,363	109,816	2,726,644	57.0	2,055,330	1,977,291	1,266,128	930,805
Great Northern	June	8,399	8,664,943	1,052,067	11,025,583	2,180,281	1,546,426	350,897	2,997,414	238,609	7,440,615	67.5	3,584,968	2,829,944	2,816,439	2,336,125
	6 mos.	8,402	44,045,871	5,233,792	56,185,558	9,394,877	9,984,451	1,648,886	18,168,158	1,346,475	41,097,168	73.1	15,088,390	10,841,442	10,693,384	7,442,221
Green Bay & Western	June	234	165,327	3,915	172,424	28,041	22,559	8,218	58,251	2,938	120,007	69.6	52,417	43,417	32,397	15,213
	6 mos.	234	896,131	32,882	957,060	152,385	141,651	38,616	393,194	18,590	743,413	77.6	213,647	164,599	129,977	149,297
Gulf & Ship Island	June	307	191,933	33,164	241,546	63,851	70,453	4,907	87,794	7,506	237,753	98.4	3,793	—27,867	—43,296	—66,995
	6 mos.	307	1,258,655	219,432	1,631,609	340,670	312,888	30,636	635,037	47,567	1,387,813	85.1	253,796	52,825	—39,566	53,906
Gulf, Mobile & Northern	June	733	533,440	25,049	619,953	85,945	93,558	34,872	176,549	31,797	423,038	68.24	196,915	152,214	118,853	52,585
	6 mos.	733	3,302,416	149,678	3,651,054	553,071	581,361	195,602	1,103,459	174,298	2,609,829	71.48	1,041,225	791,113	593,547	512,199
Hocking Valley	June	348	1,588,474	52,906	1,859,096	198,366	320,202	16,387	469,772	50,440	1,055,167	56.8	803,929	679,875	572,664	553,756
	6 mos.	348	8,793,797	331,513	9,937,043	1,244,603	1,892,271	98,852	2,723,763	271,588	6,231,043	62.7	3,706,000	2,936,448	2,606,766	1,879,486
Illinois Central	June	5,034	9,740,770	1,752,086	12,384,273	1,731,653	3,271,829	260,771	4,204,857	350,440	9,989,388	80.7	2,394,885	1,581,746	1,614,294	1,279,300
	6 mos.	5,035	59,455,930	10,758,091	76,485,657	8,920,042	17,844,907	1,585,264	27,486,309	2,170,151	58,659,270	76.7	17,826,387	12,610,358	12,311,312	11,777,084
Yazoo & Mississippi Valley	June	1,705	1,489,955	262,237	1,880,960	387,478	500,509	43,003	768,567	63,082	1,771,087	94.2	109,873	—60,570	—119,823	—92,658
	6 mos.	1,705	10,118,571	1,474,264	12,448,993	2,210,163	2,520,631	265,164	5,031,161	387,636	10,447,780	83.9	2,001,213	978,451	543,231	563,368
Illinois Central System	June	6,740	11,243,877	2,018,163	14,282,226	2,119,131	3,779,638	303,774	4,982,142	413,669	11,776,640	82.5	2,505,586	1,521,088	1,494,383	1,183,412
	6 mos.	6,740	69,651,314	12,252,900	89,032,016	11,130,205	20,400,945	1,850,428	32,570,774	2,558,678	69,196,652	77.7	19,835,364	13,591,077	12,856,811	12,304,775
Illinois Terminal	June	473	430,018	118,062	572,000	77,040	80,792	20,056	182,446	34,991	392,455	68.81	179,545	158,283	120,503	44,953
	6 mos.	473	2,636,831	802,924	3,593,333	432,555	534,480	119,574	1,207,533	230,130	2,520,907	70.16	1,072,426	944,691	707,331	463,547
Kansas City, Mexico & Orient	June	272	170,593	5,772	201,669	35,602	46,222	8,296	60,892	11,704	162,685	80.7	38,984	34,359	57,983	30,944
	6 mos.	272	914,102	29,320	1,008,751	330,682	238,680	40,044	345,883	72,664	1,017,840	100.8	—9,089	—84,766	60,402	201,569
Kansas City, Mexico & O. of Tex.	June	465	315,533	11,293	359,806	88,479	53,951	7,694	80,679	16,245	246,769	68.6	113,037	105,924	58,407	16,181
	6 mos.	465	1,663,177	71,924	1,841,897	496,204	292,451	45,985	496,786	49,816	1,368,648	74.3	473,249	482,259	232,195	141,612
Kansas City Southern	June	784	1,222,419	95,296	1,511,892	167,083	267,224	65,013	449,124	84,854	1,037,282	68.6	474,610	357,054	305,953	237,909
	6 mos.	784	7,595,673	499,092	9,104,310	1,112,291	1,516,334	374,449	2,758,673	515,035	6,278,997	69.0	2,825,313	2,119,226	1,761,980	1,577,566
Texarkana & Ft. Smith	June	81	228,589	6,960	254,289	54,576	19,138	7,119	61,262	11,013	154,061	60.0	100,228	83,390	50,290	42,343
	6 mos.	81	1,405,538	39,350	1,557,407	170,548	138,882	42,954	364,054	65,198	789,220	50.7	768,187	658,588	462,831	341,565
Kansas, Oklahoma & Gulf	June	326	279,887	2,293	286,644	36,460	32,179	18,734	61,148	13,197	161,470	56.3	125,174	105,603	83,851	22,926
	6 mos.	326	1,720,947	15,326	1,767,727	219,906	171,799	87,763	399,340	68,193	935,326	52.9	832,401	712,695	582,433	274,695
Lake Superior & Ishpeming	June	160	379,740	562	445,101	50,270	33,506	537	71,643	7,530	163,480	36.7	281,621	237,436	233,902	188,172
	6 mos.	160	1,177,002	7,886	1,352,603	200,708	166,344	3,067	310,478	49,051	729,542	53.9	623,061	485,071	460,850	65,502
Lake Terminal	June	13	.....	.....	120,168	12,711	13,135	.....	56,107	2,107	84,060	70.0	36,108	27,854	31,376	14,155
	6 mos.	13	.....	.....	543,562	74,022	92,139	.....	293,456	12,093	471,710	86.8	71,852	39,178	51,225	—36,397
Lehigh & Hudson River	June	96	181,204	1,264	192,187	27,679	34,987	2,724	67,692	10,519	143,621	74.7	48,566	36,257	19,077	22,015
	6 mos.	96	1,188,953	6,916	1,252,506	184,749	192,081	15,879	447,898	59,280	899,887	71.8	352,619	271,677	169,175	252,509
Lehigh & New England	June	216	384,322	1,010	392,951	52,618	92,476	4,600	141,019	17,046	307,758	78.3	85,193	72,898	71,045	85,394
	6 mos.	216	2,288,660	6,193	2,331,307	287,487	558,252	38,347	845,980	103,857	1,833,861	78.7	497,446	422,838	429,419	454,321
Lehigh Valley	June	1,361	4,883,847	592,817	6,019,493	727,335	1,275,357	151,948	2,303,191	164,063	4,659,994	77.4	1,359,499	1,086,434	930,685	1,085,645
	6 mos.	1,361	29,025,751	3,116,128	35,083,722	2,946,008	7,550,249	847,439	14,202,914	909,988	26,643,002	75.9	8,440,720	6,611,191	5,741,664	4,569,444
Louisiana & Arkansas *	June		Not yet filed.													
	6 mos.		Not yet filed.													

* Includes Louisiana Ry. & Navigation Co.

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Louisiana Ry. & Nav. Co. of Texas	June	206	$71,837	$2,271	$77,286	$19,537	$13,488	$2,789	$31,754	$7,191	$74,759	96.7	$2,527	—$20,088	—$30,908	—$22,103
	6 mos.	206	448,836	14,334	492,383	143,385	85,266	17,398	228,866	34,746	509,661	103.5	—17,278	—64,073	—138,787	—153,584
Louisville & Nashville †	June	5,249	8,591,196	1,423,544	10,721,196	1,904,735	2,469,787	247,522	3,737,639	377,240	8,787,687	82.0	1,933,509	1,336,528	1,450,714	1,512,518
	6 mos.	5,098	52,482,964	7,902,489	64,859,492	10,826,138	15,009,353	1,482,750	22,860,441	2,255,315	52,753,934	81.3	12,105,558	8,618,567	8,714,798	9,964,741
Maine Central	June	1,122	1,166,330	288,926	2,137,561	254,214	586,834	22,401	550,128	49,370	1,465,855	68.6	671,706	585,121	563,582	201,331
	6 mos.	1,122	6,958,151	1,465,251	9,833,259	1,370,650	2,059,044	106,716	3,598,273	308,683	7,445,119	75.7	2,388,140	1,879,176	1,679,164	1,312,028
Midland Valley	June	364	245,136	11,665	264,893	52,937	36,636	4,600	67,383	13,316	171,691	64.8	93,202	78,699	55,905	33,825
	6 mos.	364	1,551,374	71,877	1,676,588	295,405	176,464	38,344	441,879	72,356	1,014,385	60.5	662,203	567,344	440,964	391,410
Minneapolis & St. Louis	June	1,627	953,116	59,832	1,221,970	182,966	215,661	35,209	480,042	43,094	956,790	78.3	265,180	202,964	162,843	8,178
	6 mos.	1,627	5,830,525	437,096	6,804,389	986,215	1,238,201	215,921	3,190,750	286,887	5,915,681	86.9	888,708	513,550	218,177	—270,242
Minneapolis, St. Paul & S. S. Marie	June	4,380	3,458,062	449,595	4,277,011	668,457	687,405	91,879	1,399,109	113,119	2,999,260	70.1	1,277,751	1,025,610	877,399	724,353
	6 mos.	4,380	18,501,687	2,140,682	22,406,936	3,029,324	4,368,561	479,045	8,586,709	717,228	17,277,460	77.1	5,129,476	3,696,968	2,935,675	2,194,539
Duluth, South Shore & Atlantic	June	573	350,113	43,269	436,963	103,492	68,279	8,162	166,475	10,805	358,976	82.2	77,987	46,987	30,427	—25,796
	6 mos.	573	1,991,419	311,804	2,492,955	413,977	416,495	45,348	1,074,000	67,231	2,028,211	81.4	463,744	273,742	170,989	61,734
Spokane International	June	165	82,412	8,297	106,303	16,546	11,223	3,806	29,844	7,118	69,621	65.5	36,682	31,243	24,614	19,736
	6 mos.	165	446,841	50,787	593,679	103,817	58,010	21,489	210,037	38,589	438,320	73.8	155,359	122,599	84,251	69,705
Mississippi Central	June	161	100,433	5,818	111,198	17,515	24,567	9,636	31,033	7,402	90,153	81.1	21,045	13,888	16,071	18,600
	6 mos.	161	731,613	36,509	797,445	110,648	147,312	57,044	214,258	49,130	578,385	72.5	219,060	161,923	166,334	165,585
Missouri & North Arkansas	June	364	121,750	9,538	140,950	55,107	21,990	9,352	51,877	9,131	147,887	104.9	—6,937	—9,516	—22,661	—8,982
	6 mos.	364	776,562	60,299	895,039	215,198	143,681	57,291	355,863	52,208	824,726	92.1	70,313	53,512	—22,952	—37,142
Missouri-Kansas-Texas Lines	June	3,188	3,289,634	553,167	4,725,977	816,083	748,069	139,497	1,309,551	165,686	3,192,303	67.5	1,533,674	1,237,155	1,022,206	682,392
	6 mos.	3,188	20,750,834	3,214,653	26,709,308	3,717,685	5,226,311	751,078	8,130,592	1,013,518	18,944,998	70.9	7,764,310	6,152,684	4,912,375	4,817,076
Missouri Pacific	June	7,461	8,562,356	1,142,737	10,623,056	1,947,911	1,913,576	303,929	3,623,370	389,371	8,188,302	77.1	2,434,754	1,960,877	1,454,355	1,318,426
	6 mos.	7,461	53,228,364	6,496,494	65,129,166	10,520,929	12,081,621	1,838,170	22,907,019	2,333,754	49,840,098	76.5	15,289,068	12,421,237	9,463,512	8,602,556
Gulf Coast Lines	June	1,026	887,138	129,118	1,087,908	241,939	231,353	45,618	248,857	60,545	823,461	75.69	264,447	217,127	177,671	223,536
	6 mos.	1,026	6,847,653	803,082	8,123,012	1,406,663	1,403,936	270,706	2,353,669	367,030	5,766,667	70.99	2,356,345	2,029,504	1,485,265	1,445,299
International-Great Northern	June	1,159	1,079,760	189,531	1,400,438	242,627	221,954	41,405	555,014	69,336	1,137,874	81.25	262,564	220,819	145,970	148,988
	6 mos.	1,159	7,116,344	1,043,494	9,009,417	1,480,277	1,503,476	227,810	3,693,770	422,870	7,300,372	81.03	1,709,045	1,454,485	790,691	734,106
San Antonio, Uvalde & Gulf	June	318	128,489	17,993	158,283	35,418	25,405	7,246	53,974	8,450	131,004	82.8	27,279	23,086	—8,580	23,723
	6 mos.	318	910,728	105,371	1,095,891	231,113	163,595	42,758	284,000	50,890	770,620	70.3	325,271	299,938	126,792	197,625
Texas & Pacific	June	2,015	2,858,221	479,975	3,593,058	585,716	602,206	95,916	1,136,129	121,952	2,565,247	71.4	1,027,811	839,277	586,166	681,807
	6 mos.	2,015	18,482,520	2,740,691	22,715,113	3,522,989	3,911,100	533,226	7,294,942	736,737	16,014,591	70.5	6,700,522	5,496,447	3,881,429	4,798,914
Mobile & Ohio	June	1,159	1,243,194	87,920	1,504,470	235,238	263,384	56,629	496,690	48,328	1,098,639	73.0	405,831	318,901	263,399	132,416
	6 mos.	1,159	7,599,011	494,497	8,680,679	1,308,631	1,626,139	341,942	3,122,226	294,979	6,682,425	77.0	1,998,254	1,483,940	1,175,800	989,931
Monongahela	June	171	605,993	8,652	623,893	80,000	75,000	1,998	137,819	12,244	306,898	49.2	316,995	290,420	187,698	179,293
	6 mos.	171	3,631,127	64,233	3,730,194	480,000	450,000	7,591	935,214	68,395	1,938,561	52.0	1,791,633	1,643,280	1,032,057	837,190
Monongahela Connecting	June	6	.....	.....	234,558	30,116	34,112	300	94,676	3,436	162,640	69.3	71,918	59,619	49,507	36,006
	6 mos.	6	.....	.....	1,328,500	144,381	205,055	1,800	563,556	23,574	938,366	70.6	390,134	320,987	286,145	172,616
Montour	June	56	242,031	1	243,140	34,213	62,866	1,704	47,867	7,070	152,502	62.7	90,638	88,767	101,839	52,321
	6 mos.	56	1,085,905	2	1,089,627	142,521	298,597	8,266	251,567	43,494	739,953	67.9	349,674	339,931	406,646	310,719
Nashville, Chatt. & St. Louis	June	1,222	1,460,462	241,714	1,868,750	227,362	391,284	82,866	644,614	80,835	1,433,128	76.7	435,622	340,541	343,280	234,802
	6 mos.	1,247	9,083,074	1,541,937	11,708,726	1,381,505	2,301,763	504,071	4,054,004	490,190	8,768,910	74.9	2,939,816	2,405,257	2,410,712	1,664,820
Nevada Northern	June	165	102,019	6,440	123,313	13,219	8,504	987	15,623	5,265	43,870	35.6	79,443	62,566	59,677	37,201
	6 mos.	165	602,521	39,830	720,446	74,065	41,555	5,906	107,374	30,751	260,860	36.2	459,586	369,555	357,508	173,349
Newburgh & South Shore	June	6	.....	.....	185,577	14,812	30,413	.....	70,058	6,098	121,381	65.4	64,196	46,613	52,425	46,067
	6 mos.	6	.....	.....	961,004	69,595	193,947	.....	399,504	37,443	700,489	72.9	260,515	164,995	199,362	181,071
New Orleans Great Northern	June	276	237,967	19,571	278,738	48,547	48,134	12,959	79,302	11,602	200,544	72.0	78,194	60,387	35,664	18,059
	6 mos.	276	1,432,499	96,147	1,589,860	262,259	239,254	79,929	468,665	70,050	1,120,162	70.5	469,698	363,451	213,842	239,462
New Orleans Terminal	June	20	130	.....	196,172	14,658	11,162	.....	56,070	1,531	83,421	42.5	112,751	101,744	88,934	65,269
	6 mos.	20	14,781	.....	1,008,082	100,347	56,075	.....	363,038	9,906	529,366	52.5	478,716	416,761	341,357	221,508
New York Central	June	6,914	19,499,776	9,341,484	33,811,021	4,620,624	6,902,550	469,285	10,980,228	985,325	24,526,860	72.5	9,284,161	6,785,246	6,436,068	6,115,611
	6 mos.	6,914	119,915,861	47,130,718	193,739,620	24,297,014	43,688,742	2,814,400	67,586,828	5,490,255	146,945,540	75.9	46,794,080	32,679,512	31,247,488	28,545,314
Cincinnati Northern	June	244	279,934	3,201	291,788	35,949	62,866	5,863	93,090	9,968	207,730	71.2	84,058	60,058	59,430	21,118
	6 mos.	244	1,764,825	18,494	1,829,202	214,146	409,629	35,771	625,562	59,591	1,344,694	73.5	484,508	351,281	284,350	259,950
Cleve., Cinn., Chicago & St. Louis	June	2,397	5,631,086	1,291,188	7,624,171	947,537	1,728,402	158,691	2,619,860	242,943	5,784,516	75.9	1,839,655	1,394,063	1,274,983	942,407
	6 mos.	2,397	34,274,258	7,022,742	45,265,354	4,664,414	10,035,105	918,519	16,595,329	1,434,538	34,157,765	75.5	11,107,589	8,385,931	7,751,744	6,314,578
Indiana Harbor Belt	June	117	.....	.....	1,072,571	108,000	108,268	4,541	390,220	38,166	659,333	61.5	413,238	344,493	308,593	281,455
	6 mos.	119	.....	.....	6,329,021	648,000	675,225	30,343	2,550,622	167,624	4,148,176	65.5	2,180,845	1,792,532	1,531,377	1,343,370
Michigan Central	June	1,858	5,341,309	1,959,821	8,135,612	946,758	1,633,462	140,043	2,432,227	174,875	5,447,624	67.0	2,687,988	2,142,014	2,020,488	2,053,529
	6 mos.	1,858	34,206,622	9,671,798	48,838,929	4,688,783	10,303,874	799,979	15,338,802	1,031,442	32,808,348	67.2	16,030,581	12,624,788	11,654,726	10,877,246

† Includes the Louisville, Henderson & St. Louis.

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Pittsburgh & Lake Erie	June	231	$2,566,122	$179,913	$2,878,278	$320,027	$992,737	$27,246	$925,732	$81,211	$2,355,632	81.8	$522,646	$321,746	$646,423	$685,559
	6 mos.	231	15,044,637	1,103,938	16,888,672	1,919,070	6,031,907	172,531	5,456,557	474,805	14,110,647	83.6	2,778,025	1,737,762	3,827,242	3,349,891
New York, Chicago & St. Louis	June	1,690	4,412,836	199,922	4,776,767	612,648	883,612	125,151	1,583,757	137,428	3,340,654	69.9	1,436,113	1,148,857	898,322	575,386
	6 mos.	1,690	26,049,423	884,312	27,852,264	3,318,794	5,298,576	575,118	9,611,530	762,146	19,508,933	70.0	8,343,331	6,711,165	5,411,756	3,895,754
N. Y., New Haven & Hartford	June	2,132	6,666,668	3,971,188	11,861,331	1,864,306	1,943,255	95,863	3,481,827	328,255	7,877,657	66.4	3,983,674	3,341,800	2,806,737	2,427,197
	6 mos.	2,130	37,411,002	22,482,164	67,386,025	9,115,520	11,877,541	595,697	21,313,199	2,011,233	45,931,711	68.2	21,454,314	17,288,900	14,164,925	11,105,600
New York Connecting	June	20	209,337	.....	237,120	21,102	12,761	.....	36,839	1,493	72,195	30.4	164,925	128,925	107,835	35,597
	6 mos.	20	1,279,822	.....	1,474,574	299,532	47,483	.....	222,216	11,536	580,767	39.4	893,807	669,807	516,401	475,889
New York, Ontario & Western	June	568	664,720	171,129	1,046,249	150,000	194,744	19,263	422,562	35,537	823,022	78.7	223,227	178,227	122,132	106,198
	6 mos.	568	3,981,846	479,041	5,421,273	702,690	1,110,455	116,750	2,604,113	208,751	4,761,852	87.8	659,421	389,349	73,789	35,150
Norfolk & Western	June	2,240	8,759,310	452,866	9,495,976	1,024,702	1,642,953	119,255	2,137,930	243,138	5,171,621	54.5	4,324,355	3,523,177	3,722,431	2,645,916
	6 mos.	2,240	51,035,571	2,516,509	56,313,461	7,071,238	10,434,623	713,083	13,148,845	1,443,949	32,868,479	59.4	22,444,982	17,638,272	19,034,062	13,418,266
Norfolk Southern	June	931	688,254	36,677	767,813	98,112	104,043	28,353	269,294	29,300	524,918	68.4	242,895	191,546	156,442	233,131
	6 mos.	931	3,781,400	185,080	4,249,200	575,810	619,329	163,352	1,622,041	174,228	3,138,880	73.9	1,110,320	803,315	654,664	917,295
Northern Pacific	June	6,792	6,117,766	1,143,890	8,146,858	1,665,058	1,595,290	296,093	2,688,353	274,732	6,659,490	81.7	1,487,368	763,138	1,134,902	1,350,888
	6 mos.	6,792	35,261,749	4,879,603	44,665,953	7,109,102	9,275,389	1,429,978	15,871,144	1,576,589	35,850,234	80.3	8,815,719	4,811,478	7,197,078	7,634,129
Northwestern Pacific	June	477	302,169	171,306	526,755	90,915	73,075	8,411	239,187	16,390	427,798	81.2	98,957	60,592	60,600	59,081
	6 mos.	477	1,615,640	801,164	2,715,492	573,191	537,720	48,439	1,356,828	111,296	2,624,609	96.7	90,883	—138,793	—148,273	—243,545
Pennsylvania R. R.	June	10,473	40,991,748	11,088,147	58,026,096	7,400,910	10,846,558	1,047,680	19,339,099	1,773,533	41,026,733	70.7	16,999,363	13,490,471	12,020,998	10,203,032
	6 mos.	10,473	233,823,744	63,909,175	330,749,406	40,349,546	65,948,060	5,319,527	114,766,805	9,843,095	240,187,485	72.6	90,561,921	72,982,038	65,318,909	50,760,063
Long Island	June	404	896,521	2,749,379	3,824,992	442,252	461,786	22,193	1,278,955	66,772	2,273,087	59.4	1,551,905	1,246,798	1,058,443	751,017
	6 mos.	404	5,546,731	12,749,839	19,331,691	2,438,696	2,963,714	118,850	7,666,812	379,127	13,573,277	70.2	5,758,414	4,768,190	3,838,361	2,743,642
West Jersey & Seashore	June	370	449,511	409,878	902,952	120,391	108,004	5,743	343,375	17,905	598,254	66.3	304,698	200,808	175,041	57,428
	6 mos.	370	2,502,178	1,823,043	4,548,259	664,103	650,670	28,941	1,963,441	93,322	3,410,248	75.0	1,138,011	850,602	709,462	114,804
Peoria & Pekin Union	June	19	13,939	1,351	135,877	18,215	13,508	5,141	56,820	8,021	101,705	74.9	34,172	20,422	39,825	65,590
	6 mos.	19	117,574	9,281	885,549	102,940	79,561	33,669	382,781	52,685	651,636	73.6	233,913	135,086	235,278	357,090
Pere Marquette	June	2,241	3,630,568	262,371	4,172,152	635,823	808,482	65,306	1,276,546	145,165	2,888,449	69.2	1,283,703	1,015,627	822,291	495,938
	6 mos.	2,241	20,218,239	1,391,506	23,071,691	2,438,450	4,729,755	387,454	7,667,722	772,344	15,977,610	69.3	7,094,081	5,582,158	4,728,418	3,767,086
Pittsburgh & Shawmut	June	102	118,746	2,324	123,062	22,455	32,432	1,708	35,324	6,995	98,914	80.4	24,148	22,748	24,143	45,649
	6 mos.	102	794,783	22,511	829,470	120,467	201,636	10,208	241,456	47,537	621,304	74.9	208,166	200,102	215,060	317,877
Pittsburgh & West Virginia	June	92	389,090	3,634	422,467	44,616	80,844	17,286	70,355	26,855	249,905	59.2	172,562	128,630	216,983	186,297
	6 mos.	92	2,362,850	25,174	2,581,059	146,346	481,585	103,546	452,693	139,374	1,388,118	53.8	1,192,941	883,368	1,326,979	966,902
Pittsburgh, Shawmut & Northern	June	198	127,397	795	135,877	33,541	28,934	1,565	43,432	7,752	115,224	84.8	20,653	17,672	10,585	33,282
	6 mos.	198	870,935	8,361	905,904	172,631	173,698	9,979	286,337	38,142	680,787	75.9	225,117	207,141	160,399	154,093
Quincy, Omaha & Kansas City	June	249	42,165	7,471	57,759	32,627	10,662	746	43,562	2,043	89,622	155.2	—31,863	—36,720	—39,157	—20,540
	6 mos.	249	236,745	57,775	333,724	155,081	52,781	4,258	167,868	15,817	395,416	118.5	—61,692	—90,832	—105,046	—93,809
Reading	June	1,459	6,328,637	573,167	7,492,174	1,441,657	1,820,438	102,426	2,853,439	235,963	6,481,980	86.5	1,010,194	722,321	729,511	836,029
	6 mos.	1,460	40,692,251	3,567,420	47,812,331	7,030,092	11,031,366	548,284	17,868,314	1,337,616	37,994,800	79.5	9,817,531	7,744,742	7,774,762	7,185,684
Atlantic City	June	163	180,624	214,217	417,451	64,164	3,813	1,183	168,006	3,181	240,537	57.6	176,914	137,114	135,794	—40,872
	6 mos.	163	724,540	673,329	1,510,605	363,287	141,379	26,671	1,013,232	30,971	1,576,281	104.3	—65,676	—307,000	—428,844	—669,594
Richmond, Fredericksburg & Potomac	June	117	638,204	238,722	1,039,401	198,493	179,697	8,913	330,425	37,135	770,671	74.1	268,730	216,120	160,579	127,177
	6 mos.	117	3,453,488	2,088,895	6,663,551	855,948	1,024,787	57,886	2,125,847	217,636	4,427,447	66.4	2,236,104	1,850,991	1,471,463	1,051,146
Rutland	June	413	293,155	70,308	514,388	107,286	110,087	10,580	190,613	18,394	439,045	85.4	75,343	49,297	58,185	72,856
	6 mos.	413	1,753,658	484,711	3,003,497	522,675	619,982	63,962	1,184,688	101,566	2,503,327	83.3	500,170	344,650	393,952	472,886
St. Louis-San Francisco	June	5,304	5,197,933	958,692	7,085,445	1,003,606	1,626,176	140,357	2,211,794	228,626	5,114,781	72.19	1,970,664	1,529,469	1,539,997	1,415,876
	6 mos.	5,304	30,886,162	5,238,107	40,104,119	5,317,595	8,350,772	797,694	13,529,094	1,420,250	29,123,053	72.62	10,981,066	8,532,348	8,979,237	8,695,893
Ft. Worth & Rio Grande	June	233	94,714	7,123	134,450	32,206	18,413	3,675	41,966	5,441	101,725	75.7	32,725	28,464	21,857	—21,296
	6 mos.	233	487,838	45,914	620,508	160,265	109,436	20,484	266,120	31,478	587,194	94.6	33,314	7,067	—43,620	—65,444
St. Louis-San Francisco & Texas	June	154	126,921	10,905	151,817	26,145	26,878	5,319	55,799	7,328	120,669	79.5	31,148	28,068	562	—26,167
	6 mos.	154	800,592	67,501	914,080	159,244	153,814	32,895	343,038	46,307	734,246	80.3	179,834	161,247	—3,989	—27,160
St. Louis Southwestern	June	939	1,408,906	65,005	1,626,002	165,409	208,812	72,210	400,494	66,821	922,756	56.7	703,246	630,480	512,592	264,909
	6 mos.	939	8,276,941	352,678	9,134,117	978,780	1,351,547	429,838	2,352,984	402,978	5,573,956	61.0	3,560,161	3,173,608	2,418,798	1,943,952
St. Louis Southwestern of Texas	June	807	525,379	39,926	697,479	384,701	123,053	30,104	285,057	37,486	869,145	124.6	—171,666	—199,324	—166,554	—14,838
	6 mos.	807	3,003,721	214,730	3,656,437	1,667,888	769,286	174,273	1,733,520	212,095	4,605,693	126.0	—949,256	—1,117,321	—963,504	—276,459
San Diego & Arizona	June	156	124,242	16,572	148,753	16,146	17,050	4,046	29,155	8,040	75,772	59.0	72,981	67,073	66,998	40,483
	6 mos.	156	583,666	119,925	723,264	117,388	100,314	25,601	178,842	48,538	479,187	66.3	244,077	208,728	208,347	148,715
Seaboard Air Line	June	4,490	3,652,273	448,096	4,613,376	595,368	808,706	200,250	1,573,525	172,817	3,388,396	73.4	1,224,980	895,702	938,111	770,095
	6 mos.	4,490	24,539,226	4,256,947	31,800,215	3,858,555	5,291,359	1,222,595	10,876,253	1,057,336	22,744,387	71.5	9,055,828	7,021,209	6,122,863	5,480,908
Southern Ry.	June	6,730	8,155,184	2,007,034	12,714,439	1,803,429	2,426,570	252,574	3,706,748	382,011	8,647,166	68.0	4,067,273	3,197,089	3,178,818	2,009,808
	6 mos.	6,730	53,512,606	10,984,513	71,885,460	10,919,864	12,869,777	1,487,584	23,592,268	2,244,609	51,538,109	71.7	20,347,351	15,612,868	14,915,615	13,098,456

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Alabama Great Southern	June	314	$619,693	$148,367	$923,012	$148,810	$201,050	$23,101	$240,995	$26,458	$647,177	70.1	$275,835	$195,443	$227,613	$141,790
	6 mos.	314	3,922,763	788,956	5,188,762	858,059	1,035,981	129,039	1,470,050	146,158	3,678,823	70.9	1,509,939	1,103,102	1,249,090	1,047,048
Cinn., New Orleans & Tex. Pacific.	June	338	1,564,223	245,968	2,123,621	369,652	456,942	40,415	508,223	53,483	1,435,031	67.6	688,590	574,030	520,782	336,686
	6 mos.	338	9,086,841	1,581,923	11,545,823	3,035,418	2,482,791	263,238	3,147,523	322,129	9,327,739	80.8	2,218,084	1,711,307	1,507,846	2,291,566
Georgia Southern & Florida	June	397	243,764	63,109	413,860	68,051	94,659	2,939	128,326	4,190	301,460	72.8	112,400	89,043	88,342	19,467
	6 mos.	397	1,391,747	642,648	2,321,783	460,347	493,671	29,787	843,028	36,222	1,903,864	82.0	417,919	276,918	269,694	66,122
New Orleans & Northeastern	June	204	336,076	63,764	464,210	61,975	96,742	12,701	126,220	15,079	316,413	68.2	147,797	99,320	60,741	42,158
	6 mos.	204	2,137,009	382,479	2,804,295	369,737	505,112	71,087	792,381	89,032	1,850,293	66.0	954,002	667,074	440,692	391,696
Northern Alabama	June	110	83,828	4,530	98,168	21,165	3,200	2,279	29,543	2,721	58,907	60.0	39,261	31,776	11,915	—3,732
	6 mos.	110	566,559	32,534	626,933	128,693	19,558	13,663	179,979	16,624	358,593	57.2	268,340	222,804	108,332	126
Southern Pacific	June	8,891	14,208,373	3,926,018	20,154,406	2,309,775	3,011,938	450,338	6,110,970	641,178	12,975,381	64.4	7,179,025	5,450,017	4,769,108	4,290,264
	6 mos.	8,889	78,425,269	19,598,187	108,828,028	13,668,345	18,320,901	2,630,019	35,203,346	3,971,441	75,877,099	69.7	32,950,929	23,970,953	21,711,515	19,078,394
So. Pacific Steamship Lines	June	....	733,332	65,623	930,556	25,020	228,522	22,648	554,830	33,686	864,706	92.9	65,850	64,742	67,970	78,108
	6 mos.	....	4,541,858	279,317	5,598,026	147,582	1,469,829	121,866	3,481,615	199,052	5,419,944	96.8	178,082	163,054	179,340	340,917
Texas & New Orleans	June	4,729	4,461,182	936,445	5,943,954	1,022,708	1,250,924	180,501	1,928,986	268,903	4,681,519	78.8	1,262,435	950,305	641,873	563,730
	6 mos.	4,729	27,980,343	5,278,138	36,237,246	5,633,792	7,473,652	1,062,049	11,991,376	1,565,724	27,796,652	76.7	8,440,594	6,401,364	4,627,042	2,367,587
Spokane, Portland & Seattle	June	554	611,291	112,069	863,646	143,463	113,315	13,782	242,055	23,136	542,407	62.8	321,239	235,903	221,786	164,096
	6 mos.	554	3,438,604	482,794	4,387,103	643,918	632,089	67,608	1,342,305	144,907	2,858,375	65.2	1,528,728	1,016,752	949,162	842,406
Tennessee Central	June	296	236,501	17,741	284,088	48,293	38,890	8,839	90,662	13,107	199,503	70.2	84,585	78,874	61,864	7,262
	6 mos.	296	1,378,011	98,222	1,584,907	309,118	257,047	53,142	573,998	77,709	1,269,808	80.1	315,099	278,928	175,616	178,991
Terminal R. R. Assn. of St. L.	June	55	.....	.....	1,055,169	147,142	75,024	2,258	450,936	26,388	705,499	66.9	349,670	249,551	335,291	274,902
	6 mos.	55	.....	.....	6,326,591	831,910	500,450	16,542	2,846,186	164,216	4,377,626	69.2	1,948,965	1,328,969	1,859,504	1,972,903
Texas Mexican	June	162	94,038	3,118	105,474	16,256	19,923	4,223	38,591	8,310	86,724	82.2	18,750	13,735	6,016	4,991
	6 mos.	162	601,677	17,127	695,144	115,280	112,642	24,692	262,386	46,470	558,929	80.4	136,215	105,944	58,530	115,360
Toledo, Peoria & Western	June	239	186,860	470	191,613	21,288	23,585	12,379	59,272	9,106	125,630	65.6	65,983	57,987	46,247	31,664
	6 mos.	239	1,049,094	4,531	1,087,125	109,165	137,553	68,691	376,764	52,335	744,508	68.5	342,617	298,153	239,114	87,668
Toledo Terminal	June	28	.....	.....	130,532	11,917	17,949	627	52,143	5,057	86,369	66.2	44,163	27,233	47,616	53,861
	6 mos.	28	.....	.....	807,515	57,380	104,762	3,453	336,969	33,566	534,806	66.2	272,709	174,492	318,125	313,999
Trinity & Brazos Valley	June	367	114,628	6,980	128,564	63,259	34,469	5,577	66,102	11,449	180,850	140.6	—52,286	—60,100	—81,234	—50,159
	6 mos.	367	856,700	34,107	936,267	271,509	204,088	32,868	443,425	70,641	1,015,829	108.5	—79,562	—126,430	—273,493	—145,222
Ulster & Delaware	June	128	40,805	18,258	103,260	20,703	16,036	1,317	45,166	4,194	87,416	84.6	15,844	9,844	6,721	6,268
	6 mos.	128	207,830	37,729	478,822	95,707	90,843	7,466	240,542	24,830	459,388	95.9	19,434	—8,466	—23,916	—36,897
Union R. R. of Penna.	June	45	.....	.....	1,125,486	111,078	167,765	175	367,530	15,382	661,905	58.8	463,581	474,478	566,409	401,120
	6 mos.	45	.....	.....	5,209,945	537,871	1,040,217	1,049	2,125,561	85,249	3,789,922	72.7	1,420,023	1,271,196	1,663,703	1,192,841
Union Pacific	June	3,765	6,646,631	1,630,760	9,308,165	1,406,602	1,939,954	233,802	2,435,805	349,564	6,636,795	71.3	2,671,370	1,925,589	1,772,274	1,328,485
	6 mos.	3,765	41,507,394	7,245,477	53,673,703	6,598,988	11,712,421	1,162,902	15,070,592	2,042,012	37,659,404	70.2	16,014,299	11,643,995	10,840,204	9,928,839
Oregon Short Line	June	2,539	2,186,070	401,525	2,888,940	646,059	416,551	67,034	850,402	137,424	2,204,633	76.3	684,307	386,949	327,268	269,477
	6 mos.	2,539	14,636,332	1,886,303	17,895,344	3,149,685	2,756,994	342,697	5,212,383	797,968	12,629,706	70.6	5,265,638	3,550,203	3,166,470	2,364,037
Oregon-Wash. R. R. & Nav.	June	2,365	1,789,667	319,933	2,369,083	498,012	366,267	79,819	827,763	140,756	1,937,576	81.8	431,507	230,326	105,007	54,574
	6 mos.	2,365	10,623,454	1,483,110	13,397,012	2,668,447	2,235,791	479,811	5,185,122	807,351	11,526,742	86.0	1,870,270	675,145	—53,975	—313,633
Los Angeles & Salt Lake	June	1,208	1,573,511	580,409	2,357,543	362,744	310,191	95,691	643,433	87,486	1,556,044	66.0	801,499	649,361	536,550	219,003
	6 mos.	1,208	10,077,774	2,246,252	13,500,571	2,106,351	2,186,607	513,127	3,965,049	510,257	9,789,586	72.5	3,710,985	2,855,175	2,248,097	300,996
St. Joseph & Grand Island	June	258	243,554	9,991	277,812	62,755	38,505	3,297	98,647	16,728	219,932	79.2	57,880	41,493	25,976	—3,822
	6 mos.	258	1,617,113	66,901	1,799,643	278,786	243,868	19,285	631,677	96,564	1,270,180	70.6	529,463	413,849	309,003	369,291
Utah	June	111	96,859	.....	99,314	18,661	30,708	352	23,380	5,009	78,110	78.6	21,204	13,158	9,443	—10,774
	6 mos.	111	1,016,825	.....	1,020,247	143,376	224,209	2,213	220,602	32,269	622,669	61.0	397,578	322,328	284,895	102,913
Virginian	June	545	1,422,360	25,780	1,526,577	171,082	273,486	14,090	296,740	35,360	788,438	51.6	738,139	578,137	646,195	424,621
	6 mos.	545	8,997,282	172,699	9,643,633	1,016,504	1,684,862	86,098	1,915,875	196,248	4,887,885	50.7	4,755,748	3,735,740	4,173,877	2,976,241
Wabash	June	2,523	5,068,422	681,560	6,220,567	971,211	1,081,723	192,959	2,295,469	238,551	4,805,785	77.3	1,414,782	1,143,298	830,875	738,783
	6 mos.	2,523	31,100,321	3,446,991	37,050,482	4,967,379	6,359,991	1,069,913	13,882,560	1,211,810	27,623,563	74.6	9,426,919	7,738,814	5,751,912	4,634,021
Ann Arbor	June	293	468,866	14,618	506,843	65,974	112,187	14,453	188,195	12,279	381,979	75.4	124,864	98,842	70,487	57,933
	6 mos.	293	2,918,801	94,711	3,117,764	316,078	621,074	86,138	1,189,201	71,164	2,267,359	72.7	850,405	685,894	519,977	399,328
Western Maryland	June	874	1,460,682	27,197	1,540,212	279,581	299,031	43,375	400,314	42,445	1,068,423	69.4	471,789	391,789	413,356	355,132
	6 mos.	875	8,538,973	150,423	9,020,212	1,462,999	1,804,592	256,457	2,482,161	254,307	6,271,896	69.5	2,748,316	2,268,316	2,499,379	2,374,660
Western Pacific	June	1,051	1,031,892	208,735	1,353,326	332,075	287,555	70,941	488,195	46,360	1,259,584	93.1	93,742	—7,236	66,372	—27,446
	6 mos.	1,051	6,668,567	645,905	7,830,594	1,589,154	1,618,229	424,257	2,892,914	285,007	6,897,984	88.1	932,610	322,177	691,878	—34,382
Wheeling & Lake Erie	June	511	1,831,994	20,320	1,989,787	260,079	442,416	38,604	532,796	48,383	1,319,162	66.3	670,625	523,488	516,506	516,636
	6 mos.	511	10,086,629	127,719	10,861,090	1,225,582	2,534,370	225,321	3,012,891	283,871	7,283,851	67.1	3,577,239	2,726,704	2,620,202	1,958,222
Wichita Falls & Southern	June	168	80,002	1,121	94,130	15,784	11,188	2,849	24,978	3,817	58,616	62.27	35,514	30,033	25,233	18,646
	6 mos.	168	452,681	9,446	498,311	78,407	66,534	15,714	151,741	27,812	340,208	68.27	158,103	124,744	104,122	72,983

News of the Week

(Continued from page 393)

ment of the law would be at least $523,000 while the Southern Pacific estimates that its annual saving would be more than $446,000.

The railroads state that the passenger train limit places them at a disadvantage with other western roads which do not operate through Arizona in the solicitation of parties which for social or business reasons desire to travel on one train but are composed of so many persons that they cannot be carried on a 14-car train. The Santa Fe is at times compelled to furnish meals at eating houses instead of on diners because of the law.

C. N. R. Six Months Earnings

Gross earnings of $127,145,211, operating expenses of $106,256,266 and net earnings of $20,888,945, were reported by the Canadian National for the six months ending June 30, according to the financial statement recently issued. Compared with the first six months of 1928, the foregoing figures represent respectively increases of $3,931,685 or 3.19 per cent in gross earnings, $2,913,116 or 2.82 per cent in expenses and $1,018,570 or 5.13 per cent in net earnings. The operating ratio for the first six months of the current year was 83.57 per cent.

The statement also reports increased gross earnings for the month of June as compared with those of June, 1928. During June, 1929, this figure was $22,196,921 as against gross earnings of $22,032,767 in June, 1928. Operating expenses during June, 1929, were $19,755,993 and net earnings of the month were $2,440,928. These compare respectively with June, 1928, operating expenses of $19,226,109 and net earnings of $2,806,658. Thus, despite the increased gross earnings in June, 1929, the net earnings were $365,731 less than those of the corresponding 1928 month. The report points out that a considerable proportion of the increased operating expenses of June this year was due to recent wage increases.

* * *

On the Boston & Maine

Traffic

Seventy car loads of walnut logs from Australia left Cape Charles, Va., over the Pennsylvania on July 26, for Indianapolis, Ind. The shipment included 372 logs, some of which measured 6 ft. in diameter.

The Moffat tunnel (Colorado), which was blocked on July 25 by failure of timbering and a cave-in near East Portal, Colo., was reopened and Denver & Salt Lake trains resumed operation through it on July 30.

The Pere Marquette launched two high-speed car ferries, for use on Lake Michigan between Ludington, Mich. and points in Wisconsin, at Manitowoc, Wis. on August 6. These boats, which were constructed by the Manitowoc Ship-building Corporation, are driven at a rate of 18 m. p. h. by turbine-electric propulsion equipment and are expected to reduce the time consumed in crossing the lake.

Railroads between Chicago and points in California will again establish a $52.50 one-way passenger fare as a means of combating motor coach competition. These rates are the same as those that were in effect from March 15 to April 30 and which at that time proved so successful. This time the rates will be in effect from August 15 to September 15 and, as before, will be honored only in day coaches.

The Chicago, Milwaukee, St. Paul & Pacific and the Union Pacific have jointly purchased a large tract of land in Spokane, Wash.—16 city blocks—on which they will develop an industrial district. Three sets of industrial trackage will serve the tract, which, when developed will consist of three strips five blocks long and 250 ft., 320 ft. and 180 ft. wide respectively. Plans call for the laying of water mains, tracks and grading.

The Minneapolis & St. Louis and the Wabash have reduced the running time of the North Star Limited between St. Paul, Minn. and St. Louis, Mo. 50 minutes. The train now leaves St. Paul at 3:30 p. m. instead of 6:30 p. m. and arrives in St. Louis at 9:58 a. m. instead of 1:48 p. m. This train also carries cars from Kansas City which arrive there at 10:20 a. m. instead of 4:33 p. m. Returning, the train leaves St. Louis at 2:00 p. m. as formerly and arrives in St. Paul at 8:15 a. m. instead of 9:00 a. m. Train No. 4 of the Minneapolis & St. Louis now leaves St. Paul at 7:45 p. m. instead of 9:00 p. m. and arrives in Des Moines at 9:40 a. m. instead of 10:20 a. m.

Freight Commodity Statistics

The Interstate Commerce Commission has issued a summary of freight commodity statistics of Class I steam railways for the first quarter of 1929. It shows tons of freight originated totaling 286,783,369 as compared with 274,315,087 in 1928, an increase of 12,468,282 tons. Products of mines show an increase of about 7 per cent and manufactures and miscellaneous 8 per cent, but there are decreases under the heads of Animals and of Products of Forests. These with slight changes in other commodities result in a total increase, as shown above, of about 4½ per cent. The statement contains the usual totals of the six classes of commodities for each of the regions and districts, together with eight pages showing totals of commodities in extensive detail, for each region, under the heads of Revenue Freight Originated, Revenue Freight Terminated and Total Carried, with Freight Revenue; alto total revenue freight traffic on each of the leading railways—those having over $10,000,000 of freight revenue for the year 1928.

Examiners' Report on Western Trunk Line Freight Rates

The Interstate Commerce Commission, on August 7, made public a report proposed to the commission by William J. Koebel and Peter C. Paulson, examiners, on Part 2 of the rate structure investigation No. 17,000, which is a pamphlet of 225 pages, discussing at length the class freight rates in Western trunk line territory, with historical notes going back to the early days of railroading. The rates in issue, generally speaking, are those on freight moving between points in W. T. L. territory; and between points in that territory on the one hand and points in the entire country east of the Mississippi River and Lake Michigan on the other hand, including lake-and-rail.

Dissatisfaction has existed for many years and finally the railroads filed a petition seeking a complete revision, and the commission began the present investigation, at the same time including matters brought up by other complaints. Hearings were held in Chicago and in the principal cities in W. T. L. territory. The railroads also filed petitions with state commissions asking revision of intrastate rates, and a committee of state commissioners has cooperated with the I. C. C. The state cases of Nebraska, South Dakota and Michigan were heard jointly with the federal proceedings.

The examiners recommend that W. T. L. territory be divided into three zones. The lowest-rated zone includes, roughly, that part of the territory east of the Missouri River and Sioux Falls—Twin Cities-Duluth line. The intermediate zone lies west thereof and includes most of eastern Kansas, southeastern Nebraska, and the area east of a line from Sioux City through Mitchell and Aberdeen, S. Dak., and Fargo and Grand Forks, N. Dak., to Duluth. The highest-rated zone includes that part of the territory west and north of the intermediate zone. They are termed zones I, II, and III, respectively.

For application between points in the lowest-rated zone there is recommended a distance scale of rates nearly 83 per cent

of the scale prescribed for Oklahoma and other southwestern States in the consolidated Southwestern Cases; and for the intermediate zone the same as the Kansas-Missouri scale prescribed for southwestern Missouri and eastern Kansas. The highest scale is identical with the southwestern scale. For application between points in different zones, the examiners recommend that the lower or lowest scale be applied for the entire distance, plus differentials for the distances in the higher-rated zones.

The measure and progression of the scales are briefly indicated by the following first-class rates:

Miles	Scale I	Scale II	Scale III
5	32	33	36
100	66	73	79
200	91	101	109
300	109	124	133
400	127	146	157
500	142	162	174
800	187	211	227
900	198	223	240
1,500	264	296	318

While the proposed basis would effect many reductions in the present rates, increases would predominate. The measure of increase is substantially greater in the lowest-rated zone than in the others. It is intended to give W. T. L. respondents some additional revenues, which it is believed their financial condition warrants.

The plan employed in constructing rates between points in different zones in W. T. L. territory is recommended also for constructing interterritorial rates between points in Illinois, official and southern territories on the one hand, and W. T. L. territory on the other. A basic scale, approximating 68 per cent of the Southwestern scale, is recommended for application to the entire distance, plus differentials for the distance within the W. T. L. zones and in southern territory. A different method is recommended as a temporary measure for application between southern and W. T. L. territories on traffic moving through Mississippi River gateways, Memphis and south.

On lake and rail rates it is proposed that the water distance be equated to rail distance on the basis of 10 water miles to 3 rail miles.

It is recommended that the western classification shall govern both W. T. L. intraterritorial and interterritorial rates, and that the percentage relationships of the lower classes to first class should be the same as those prescribed in the consolidated Southwestern Cases, except that 37.5 per cent is proposed for fifth class.

Large groupings of points in W. T. L. territory, based on commercial reasons, are disapproved.

It is further recommended that on certain commodities, including agricultural implements, dairy products, canned goods and iron and steel articles, the rates shall be based on certain percentages of first class lower than would result by application of the full class basis. No finding is recommended as to intrastate rates.

Notice is given that all exceptions must be filed with the Commission on or before September 30, with the usual formalities; and replies to such exceptions must be filed on or before October 19. The case is assigned for oral argument in Washington on October 21, 22, 23, 24, and 25.

Equipment and Supplies

Locomotives

THE PATAPSCO & BACK RIVER has ordered two locomotives from the Baldwin Locomotive Works.

Freight Cars

THE TEXAS COMPANY is inquiring for four tank cars.

THE PACIFIC FRUIT EXPRESS is inquiring for 400 refrigerator cars of 50 tons' capacity.

THE MOSS TIE COMPANY has ordered one special box car from the Mt. Vernon Car Manufacturing Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for 1000 mill type gondola cars of 70 tons' capacity.

THE PHILLIPS PETROLEUM COMPANY has ordered ten tank cars from the General American Tank Car Corporation and five tank cars from the American Car & Foundry Company.

THE BRADEN COPPER COMPANY has ordered 23 flat cars of 30 tons' capacity from the American Car & Foundry Company.

THE CITIES SERVICE TANK LINE has ordered four tank cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of June 22.

THE PHILADELPHIA & READING COAL & IRON COMPANY has ordered ten automatic drop bottom dump cars of 35 tons' capacity from the American Car & Foundry Company.

Passenger Cars

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for from 2 to 20 oil-electric rail motor cars. This road has given an order for one club car to the Osgood Bradley Car Company.

Machinery and Tools

THE ATCHISON, TOPEKA & SANTA FE is inquiring for eight grinding machines.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for seven grinding machines.

THE NEW YORK CENTRAL is inquiring for a 52-in. boring machine.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered one Putnam double-end axle lathe from Manning, Maxwell & Moore, Inc.

THE NEW YORK CENTRAL has ordered one heavy-duty helical geared Timkenized lathe and one standard pattern helical geared Timkenized lathe from Manning, Maxwell & Moore, Inc.

Iron and Steel

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered 2,000 tons of structural steel for two bridges in Indiana from the American Bridge Company.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered 15,000 tons of rail from the United States Steel Corporation and 15,000 tons from Bethlehem Steel Company.

THE UNION PACIFIC has ordered 1,500 tons of structural steel for a passenger station at Omaha, Neb., from the Milwaukee Bridge Company and 200 tons for miscellaneous bridge work from the McClintic-Marshall Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for 400 tons of structural steel for miscellaneous bridge work, 800 tons for track elevation work at Evanston, Ill., and 650 tons for a subway at Milwaukee, Wis.

Signaling

THE CHICAGO, BURLINGTON & QUINCY has ordered from the General Railway Signal Company an electric interlocking for Lincoln, Neb.; 78 working levers. Color-light signals will be used.

THE ILLINOIS TERMINAL SYSTEM has ordered from the Union Switch & Signal Company materials for the installation of automatic block signals on its lines from Staunton, Ill., to Peoria and from Springfield, Ill., to Mackinaw Junction, a total distance of 240 miles. Color-light signals will be used.

ATCHISON, TOPEKA & SANTA FE.—*Correction.*—The contract for an electric interlocking at San Joaquin drawbridge (Cal.) was awarded to the General Railway Signal Company.

THE GRAND TRUNK has ordered from the Union Switch & Signal Company materials for the installation of automatic block signals between Battle Creek, Mich. and Charlotte, 26 miles, double track. Color-light signals will be used.

THE AMERICAN LOCOMOTIVE COMPANY has ordered from the General Railway Signal Company 25 sets of automatic train control apparatus for locomotives being built for the Cleveland, Cincinnati, Chicago & St. Louis.

THE READING COMPANY has contracted with the Union Switch & Signal Company for the installation of a new electro-pneumatic interlocking at Reading Terminal, Philadelphia. The machine will have 111 levers, and color-light signals will be used.

Supply Trade

The Youngstown Sheet and Tube Company has opened a sales promotion office at 905 Exchange Bank building, Tulsa, Okla., in charge of **J. A. Mussler.**

The National Bearing Metals Corporation has moved its office from 30 Church street to 230 Park avenue, New York City.

G. A. Secor, district sales manager of the **Buda Company,** Harvey, Ill., with headquarters at St. Louis, Mo., has been promoted to sales manager with headquarters at Chicago, succeeding J. L. Artmaier who has been granted a leave of absence.

P. F. Baillet, has been made manager of foreign sales for the **Ampco Twist Drill Company,** Jackson, Mich., with offices at 461 Eighth avenue, New York. This concern has also recently established a branch office at Minneapolis, Minn., making a total of 18 branch offices in principal cities of the country.

A fire which occurred early on the morning of August 3 in the office building of the **Waterbury Battery Company,** Waterbury, Conn., resulted in the loss only of office equipment. No records were damaged and production which is carried on in a separate building suffered no interruption.

William McBride has been elected president of the **Mead-Penn Iron Works Company,** Meadville, Pa., succeeding **Otto Kohler,** who will devote his time in future to his many other interests. Mr. McBride was the president and principal owner of the Fort Pitt Spring & Manufacturing Company, Pittsburgh, Pa., which business he sold about a year ago.

The sale of the **Commonwealth Steel** Company, Granite, Ill., to the **General Steel Castings Corporation,** which is building a plant at Eddystone, Pa., was formally closed on July 31, and the General Steel Castings Corporation acquired all the assets of the Commonwealth Steel Company. The officers of the General Steel Castings Corporation are: **R. H. Ripley,** president; **H. M. Pflager,** vice-president; **A S. Blagden,** vice-president and general manager of the Eddystone division; **Harris Hoblitzelle,** vice-president and general manager of the Commonwealth division; **G. H. Alston,** secretary and treasurer. **C. H. Howard** will act as chairman of the board.

Robert M. Waples, who has been elected secretary and manager of the service department of the **Garlock Packing Company,** with headquarters at Palmyra, N. Y., was born on February 11, 1894, at Philadelphia, Pa. He spent his early years at Ocean View, Del., and from 1911 to 1915 attended Drexel Institute, Brown Preparatory School and Pierce Business School in Philadelphia. In October of the latter year he entered the service of the Garlock Packing Company as a file clerk in the Philadelphia branch and then served successively as assistant order clerk, order clerk, chief clerk and salesman at that point. During the World War Mr. Waples served with Company I, 319th Infantry in France. In June, 1919, he was appointed a salesman in the Baltimore territory; early in 1920 he was transferred to the North and South Carolina territory and in October, 1920, he became assistant to the manager of the packing department of the United States Rubber Company at New York. During 1923 he was successively vice-president and treasurer and general manager of the Crandall Packing Company, Palmyra, and in 1924 he returned to the Garlock Packing Company as assistant to the vice-president and assistant general manager. Mr. Waples was appointed manager of the service department in March, 1927, a position he held until his election as secretary.

The Continental Brake Shoe & Equipment Company, New York, has opened a Cleveland, Ohio, office in the Terminal Tower, in charge of **Paul Zens**

Paul Zens

who has been elected a director and vice-president of the company. Mr. Zens was one of the original four members of the Jordan Motor Car Company, having gone to Cleveland with Edward S. Jordan from the old Thomas B. Jeffery Company of Kenosha, Wis. He continued in an executive capacity with the Jordan Company, in charge of purchases and later in charge of sales, leaving the company a few months ago after serving for twelve years.

W. J. Beck for 19 years director of research of the **American Rolling Mill Company,** Middletown, Ohio, has been appointed assistant to **Charles R. Hook,** general manager. Mr. Beck will have direct charge of the development in electrical steel sheets for magnetic purposes. He graduated from Purdue University in 1896 and served for several years as an electrical engineer with the Westing-

W. J. Beck

house Electric Company. He entered the service of the American Rolling Mill Company in 1903 as superintendent of its electrical department and since 1910 has served as director of research. The laboratories of the company are equipped for the study of magnetic problems involved in the designing of electrical machinery, this work has been carried on under the direction of Mr. Beck, who will now devote his entire time to this development. Mr. Beck is a member of many technical societies both in the United States and Europe.

Darius E. Peck, assistant manager of the law department of the **General Electric Company** since 1920, has been elected vice-president and general counsel, **Allen H. Jackson,** vice-president and general counsel since 1922 and associated in the company's law department

Darius E. Peck

since 1902, having asked to be relieved on August 1 of his responsibilities in active service. Darius E. Peck was born in 1877 at Hudson, N. Y. and was graduated from Williston Academy at Easthampton, Mass., and Yale University. He was admitted to the bar in

1901 and practiced law in New York city from 1902 until 1913, when he became a member of the law department of the General Electric Company and moved to Schenectady. Seven years later he was appointed assistant manager of the department, a position he held until his promotion to vice-president and general counsel. Mr. Peck has had considerable experience in the public utility field, having served in 1915 as secretary, treasurer and a director of the Schenectady Illuminating Company, the Mohawk Gas Company and the Schenectady Power Company; from 1920 for several years as a director and secretary of the Adirondack Power & Light Corporation; from 1925 until April of this year as secretary of the Mohawk Hudson Power Corporation and he is at present a director of the New York Power & Light Corporation.

Dr. Anson Hayes has been appointed director of research of the **American Rolling Mill Company,** Middletown, Ohio, in charge of all metallurgical research problems for the organization. Dr. Hayes is a graduate of Drake University in the class of 1908. He was given his masters degree at Iowa State College and his Ph.D. was received from the University of Chicago. For the past year and one half he has been chief of the chemical division of the Armco research division, before joining

Dr. Anson Hayes

the American Rolling Mill Company, he held the chair of physical chemistry at Iowa State College for 12 years and headed that division of its chemical department. He also taught graduate courses in thero-dynamics and directed research work in the study of factors that influenced the stability of iron carbide, particularly in white iron composition suitable for the manufacture of malleable iron.

Obituary

Armistead K. Baylor, commercial engineer of the General Electric Company died suddenly on August 1 at Ipswich, Mass., at the age of 61.

Construction

ARKANSAS WESTERN.—A contract for the grading for an extension from Waldron, Ark., 23.5 miles southeast, has been let to Williams & McWilliamson. The total estimated cost of constructing this branch line is $420,000.

ATCHISON, TOPEKA & SANTA FE.—A contract for the construction of a two-story brick and reinforced concrete station at Newton, Kan., has been awarded to M. R. Stauffer, Newton.

ATCHISON, TOPEKA & SANTA FE. (Kansas City Mexico & Orient).—A contract has been awarded to the List Construction Company, Kansas City, Mo., for the construction of an extension between Pisano, Tex., and Presido, 73 miles.

CHESAPEAKE & OHIO.—This company received bids until August 8, for the rebuilding of a bridge on its lines in Maysville, Ky., at a cost of approximately $174,600. Authorization has been given for the construction of a water treating plant and station on this company's lines at Boston, Ind., at an estimated expenditure of $49,000. A contract has been awarded to the West Virginia Construction Company, Charleston, W. Va., for the construction of an underpass under this company's lines in St. Albans, W. Va., the cost of the project, $110,000 being shared by the railway and city.

CHICAGO, ROCK ISLAND & PACIFIC-WABASH.—The city of St. Louis (Mo.) has passed an ordinance authorizing the construction and appropriating funds for the city's share of the cost of constructing a 120-ft. reinforced concrete and steel structure to carry the tracks of the Wabash over Kings highway at St. Louis at a cost of $52,000, and for the depression of the Wabash and Rock Island tracks adjacent to and through Forest park and for the construction of reinforced concrete viaducts to carry Union boulevard, Lindell boulevard and Grand drive over the tracks of the two companies, at a cost of $480,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract for clearing the site for the construction of a freight station on Sixteenth street between Mason and Pierce streets, Omaha, Neb., has been let to F. L. Busche, Omaha.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract for the construction of extensions and improvements to the engine-house and shops at Forty-seventh street, Chicago, has been awarded to the T. S. Leake Construction Company, Chicago.

CINCINNATI UNION TERMINALS.—A contract for the grading for the site of the new terminal project in the Mill creek bottoms at Cincinnati, O., has been let to Winston Brothers Company, Minneapolis, Minn. This work involves the placing of 6,000,000 cubic yards of earth.

DETROIT, TOLEDO & IRONTON.—A contract for the construction of a grade separation structure at Ecorse, Mich., which includes the erection of two reinforced concrete and steel spans has been let to C. R. Boulton, Columbus, Ohio. The cost of this project is estimated at $100,000.

ELIZABETH SOUTHERN.—This company has applied to the Interstate Commerce Commission for permission to construct a new line from Elizabeth, La., to Kinder, a distance of about 40 miles. This line will connect with the Santa Fe at Elizabeth and with the Gulf Coast Lines at its southern terminal.

LOS ANGELES & SALT LAKE.—This company has been authorized by the Interstate Commerce Commission to construct a branch line extending easterly approximately 22 miles from a point about seven miles south of Las Vegas, Nev., to serve the Boulder Canyon region. It is estimated the project will involve an expenditure of about $840,000.

MISSOURI PACIFIC.—This company plans the immediate expenditure of about $9,000,000 for grade revision and realinement of track on its Central Kansas division between Osawatomie, Kan. and Hoisington on the line between Kansas City, Mo., and Pueblo, Col. The improvement includes eight projects with a total of 38.4 miles of track on which the maximum grade will be 0.7 per cent and the maximum curvature, of 2 deg. 30 min. A section between Rapp, Kan., and Admire, 8.7 and another between Allen Kansas and Council Grove, 16 miles, will be completely relocated. It is expected that contracts for the work will be let before August 15 and that the entire project will be completed by July, 1930.

NEW ORLEANS, TEXAS & MEXICO.—This company has made application to the Interstate Commerce Commission for permission to construct a new line between Baton Rouge, La., and New Orleans.

NEW YORK CENTRAL.—This company has applied to the Interstate Commerce Commission for authority to construct new tracks, to eliminate grade crossings and to effect location and grade changes in connection with the New York west side improvement project recently approved by the New York State Transit Commission.

NEW YORK CENTRAL.—The New York Public Service Commission has approved plans for grade crossing elimination projects on this company's lines in New York state as follows: the Birdsall road and Main street crossings in Chappaqua and the Buffalo-Hamburg county highway crossing, in Hamburg, N. Y.

NEW YORK CENTRAL.—This company has awarded contracts as follows: To the Walsh Construction Company, Davenport,

Ia., for construction of a new bridge at East Syracuse, N. Y., and for building a pedestrian subway under its tracks at Cold Spring, N. Y.; to the Edward J. Duffy Company, New York, for the construction of a new road in connection with a grade crossing elimination in Hastings, N. Y., and for the extension of platforms, canopies, etc., on its Harlem and Hudson Divisions; to the Bates Rogers Construction Company, New York for the elimination of a grade crossing in Coxsakie, N. Y., and for a viaduct over its tracks at 241st street, New York; to the Chapman-Kruge Corporation, New York, for alterations and additions to its locomotive shops at Harmon, N. Y.; to Jandose Electrical Equipment Company, New York, for electrical work in connection with its new service station and garage on West End avenue in New York City, to J. M. Kandel, New York for plumbing and drainage for same project; to James H. Merritt & Company, New York, for heating system for West End avenue service station and garage project; and to the J. F. Fitzgerald Construction Company, Boston, Mass., for the construction of a new U. S. Terminal Railway Post Office building at Central station, Buffalo, N. Y.

PENNSYLVANIA.—A contract has been awarded to W. F. Trumble & Sons Company, Pittsburgh, Pa., for the construction of this company's new freight house to be located on Eleventh street in Pittsburgh. The building will cost approximately $1,000,000.

PENNSYLVANIA.—The New York Public Service Commission has approved plans for grade crossing eliminations on this company's lines in New York state as follows: the Outlet crossing, northeast of the Canandaigua station; the Phelps-Clifton Springs county highway crossing in Phelps; and the Colby road crossing in Protection.

PENNSYLVANIA.—A permit has been issued by the city and work has already started on the piling for the first unit of this company's new $50,000,000 rail-ship terminal on the North river in Jersey City, N. J. The terminal when completed will consist of three connected warehouse units and three piers extending into the river. The warehouse unit, for which the permit was issued, will be 160 ft. wide, 300 ft. in length, and eight stories high. This is the smallest of the three units, the other two, according to the plans, will be about twice its width but will be the same length. The three units will be connected at the front, and the entire warehouse will be surrounded by concrete drives. A plot of ground 970 ft. by 370 ft. will be covered by the building which will be of re-inforced concrete, brick and terra cotta construction. The three piers, which will be adjacent to the warehouse and extend into the river, will be 846 ft. in length and 150 ft. wide and will be of concrete construction. A space of about 200 ft. between piers will allow for shipping activities and the docking of trans-Atlantic steamers. Bids will be received soon for the construction of the first unit and one of the piers.

PORT EVERGLADES TERMINAL.—The Broward County Port Authority has awarded a contract to the Bryan & Holloway Construction Company, Inc., West Palm Beach, Fla., for the construction of this new line extending from the municipal piers at Port Everglades, Fla., to a point three-fourths of a mile south, and thence westward to cross the Florida East Coast and Seaboard Air Line rights-of-way. The track will be four-and-one-half miles in length and will cost approximately $63,976. The date of beginning construction has not been set, but the line is to be completed within 120 days from the beginning of construction operations.

SAN ANTONIO, UVALDE & GULF.—A contract for the construction of a branch line from Brundage, Tex., to a point five miles south has been awarded to William A. Smith, Houston, Tex. The estimated cost of the construction of this extension is $61,700.

ST. LOUIS SOUTHWESTERN.—A contract for the construction of a new line between Gideon, Mo., and Deering, 20 miles, has been let to Winston Brothers, St. Louis, Mo.

SANTA FE, SAN JUAN & NORTHERN.—This company has applied to the Interstate Commerce Commission for permission to build an extension to its lines from Tilden, N. M. to Cuba, a distance of about 12 miles at an estimated cost of $133,114.

TULSA UNION DEPOT COMPANY.—This company will construct a new union depot at Tulsa, Okla., on a site to be purchased from the St. Louis-San Francisco, the depot to be leased jointly by that railway, the Missouri-Kansas-Texas and the Atchison, Topeka & Santa Fe. The cost of the site and terminal building is not to exceed $1,500,000. The three railway companies involved have applied to the Interstate Commerce Commission for authority to assume obligation and liability as lessees of the new terminal.

Railway Finance

ATCHISON, TOPEKA & SANTA FE.—See St. Louis-San Francisco.

BALTIMORE & OHIO.—See Buffalo & Susquehanna.

BOISE & WESTERN.—*Operation.*—This company has applied to the Interstate Commerce Commission for authority to operate lines formerly operated by the Boise Valley Traction Company between Boise, Idaho, and Star and Onweiler Junction, Idaho. The Boise Valley Traction Company suspended operations in May, 1928.

BUFFALO & SUSQUEHANNA.—*Acquisition by B. & O.*—The board of directors of this road has prepared for the stockholders a recommendation that the proposition of the Baltimore & Ohio to purchase all outstanding Buffalo & Susquehanna preferred and common stock at $90 per share be accepted. The offer of the Baltimore & Ohio is conditioned on the deposit of two-thirds of each class of stock with the Girard Trust Company of Philadelphia by October 15 and upon the approval of the plan by the Interstate Commerce Commission.

CENTRAL VERMONT.—*Directors.*—The Central Vermont Railway, Inc., Canadian National subsidiary, which acquired the properties of the Central Vermont following the recent public auction, has elected the following directors: H. J. M. Jones, Barre, Vt.; John G. Sargent, Ludlow, Vt.; Fred A. Howland, Montpelier, Vt.; H. A. Way, Burlington, Vt.; John Branch, Jr., St. Albans, Vt.; H. M. Dewart, St Albans, Vt.; J. W. Hanley, St. Albans, Vt.; M. E. Barnes, St. Albans, Vt.; P. D. Fitzpatrick, St. Albans, Vt.; C. W. Groom, St. Albans, Vt.; H. T. Howell, St. Albans, Vt.

CHICAGO, MILWAUKEE & ST. PAUL.—*Reorganization.*—This company has been authorized by the Interstate Commerce Commission to pay, from a specially impounded fund, $180,438 for services of trustees under mortgages and to trust companies acting as transfer agent and registrar for the voting trust certificates issued under an agreement dated December 21, 1927.

GALVESTON WHARF.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $2,245,000 of refunding mortgage 5½ per cent bonds, series B, the proceeds to be used for capital purposes. The bonds will mature in 1954 and will be sold to Arthur Perry & Co., Boston, Mass., at 95, which will make the annual cost to the railroad approximately 5.884 per cent.

LONG ISLAND.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to sell at par $14,997,750 of its common stock consisting of 299,955 shares of a par value of $50 a share. Of the proceeds $13,465,180 will be used to reimburse the Pennsylvania for indebtedness incurred to that road in connection with additions and betterments and $1,532,571 will be used for other corporate purposes. The stock is to be offered on or before October 2 to the stockholders of record on August 31 to the extent of 37 per cent of their holdings.

MAYO & COOK'S HAMMOCK.—*Securities.*—This company has been granted authority by the Interstate Commerce Commission to issue 500 shares of no par common stock, and $150,000 of 7 per cent first mortgage bonds, the stock to be sold at not less than $100 a share and the

bonds at not less than 90 per cent of par and accrued interest. The proceeds are to be used for the construction and equipping of the applicants proposed line from Mayo to Cook's Hammock, Fla., a distance of 13 miles.

MIAMI MINERAL BELT.—*Stock Purchased.*—The St. Louis-San Francisco, on July 31, acquired control of this road through the purchase of its capital stock, pursuant to authority heretofore given by the Interstate Commerce Commission. The Miami Mineral Belt comprises a main line from Quapaw, Okla., to Baxter Junction, Kan., via Picher, Okla., a distance of approximately 11 miles, together with 29 miles of spur track and sidings. The road connects with the Frisco at Quapaw and at Baxter Junction. The property will continue to be operated as the Miami Mineral Belt Railroad Company.

MISSISSIPPI EXPORT RAILROAD.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue $35,921.39 of six per cent short term promissory notes, of which $10,931.21 has already been disposed of at par. Proceeds of the remaining certificates will be used in rehabilitating and maintaining the applicants line.

MISSOURI-KANSAS-TEXAS. — See St. Louis-San Francisco.

NEW ORLEANS GREAT NORTHERN.—*Purchase.*—The Gulf, Mobile & Northern is negotiating for the purchase of this road.

NEW YORK CENTRAL.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability with respect of $10,200,000 of equipment trust certificates in accordance with an agreement with the Guaranty Trust Company of New York as trustee. This issue is part of an original authorized amount of $16,500,000.

PENNSYLVANIA.—*Bonds of United New Jersey Railroad & Canal Co.*—The United New Jersey Railroad & Canal Company has applied to the Interstate Commerce Commission for authority to issue $6,020,000 of its general mortgage 4½ per cent bonds to be delivered to the Pennsylvania, its lessee, to reimburse that road for a like amount to be expended in payment of outstanding general mortgage 4 per cent bonds of the United New Jersey Railroad & Canal Company maturing September 1.

SANTA FE, SAN JUAN & NORTHERN.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue 14,180 shares of no par common stock in payment for railroad property transferred to the company by Abram Kaplan of New York and for the purpose of supplying the applicant with funds to construct an extension to its lines in New Mexico.

SEABOARD AIR LINE. —*Reorganization.*—The time when adjustment bonds of this company are acceptable for deposit under the reorganization plan has been extended to August 16. This is the second extension, the original date being set at July 15 and later extended to July 31. More than 70 per cent of the outstanding $25,000,000 of these bonds had been deposited when the latest extension was announced.

SPRINGFIELD & ST. LOUIS.—*Promissory Notes.*—This company has been granted authority by the Interstate Commerce Commission to renew from time to time unsecured promissory notes in an amount not exceeding $37,201.26.

ST. LOUIS-SAN FRANCISCO. — *Lease.* — This road, together with the Missouri-Kansas-Texas and the Atchison, Topeka & Santa Fe, has applied to the Interstate Commerce Commission for authority to assume obligation and liability as lessees of the properties of the Tulsa Union Depot Company. The applicants agree to pay to the trustee of the latter, under the first mortgage of the Tulsa Union Depot Company, rental in sums equivalent to interest on their respective portions of the bond issue under this mortgage and payments into the sinking fund in connection with expenses involved in the erection and occupation of a union passenger terminal at Tulsa. For the purpose of raising the necessary funds for the purchase of a site from the St. Louis-San Francisco, construction of the building, separation of grades, etc., it is proposed to issue $2,000,000 of 30-year 4½ per cent bonds under the terms of the mortgage and to sell them to the highest bidder.

WHEELING & LAKE ERIE.—*Directors Re-elected at Adjourned Meeting.*—At an adjourned stockholders' meeting at Cleveland, Ohio, on August 1, with E. R. Fancher, governor of the Cleveland Federal Reserve Bank, voting the stock held by the Alleghany Corporation and the New York, Chicago & St. Louis as trustee, the five members of the board of directors whose terms had expired were re-elected. The trustee voted 297,998 shares, out of a 558,639 shares of Wheeling stock outstanding, to replace the five board members who are: C. F. Taplin, George A. Coulton, Harris Creech, G. A. Tomlinson and T. S. Grasselli. Officers of the road will be elected by the directors on August 14. No attempt to contest the vote was made by the Taplin interests who withdrew from the stockholders meeting on May 22 and elected their own set of officers, claiming that the W. & L. E. directors had been serving illegally.

Dividends Declared

Maine Central.—Common, 1 per cent, quarterly, payable October 1 to holders of record September 16; Preferred, 1¼ per cent, quarterly, payable September 3 to holders of record August 15.

Average Prices of Stocks and of Bonds

	Aug. 6	Last week	Last year
Average price of 20 representative railway stocks.	152.24	151.68	118.55
Average price of 20 representative railway bonds..	90.64	90.30	92.64

Officers

Executive

H. T. Malcomson, general manager of the Toronto, Hamilton & Buffalo, has been appointed vice-president and general manager, with headquarters as before at Toronto, Ont.

Financial, Legal and Accounting

Carson L. Taylor and **William L. Hunter,** who have been connected with the legal department of the Chicago, Milwaukee, St. Paul & Pacific at Des Moines, Iowa, and Chicago respectively, have been promoted to assistant general solicitors, with headquarters at Chicago.

Marshall Carter Hall has been appointed general attorney of the Chesapeake & Ohio, with headquarters at Richmond, Va., effective August 15. Mr. Hall was born at Fredericksburg, Va., in 1883. He was educated at Fredericksburg College and the University of Virginia. From 1906 to 1907, Mr. Hall was attorney for the American Telephone and Telegraph Company and from the latter date until 1912, he served as assistant to the general counsel of the Atlantic Coast Line. He was attorney for the Associated Railways and Steamship Lines as special counsel before the Interstate Commerce Commission from 1912 to 1915, he was then engaged in general practice in Fairfax, Va., for about five years. Mr. Hall also served as assistant division counsel of the Southern and counsel for the Richmond, Fredericksburg & Potomac and the Washington-Virginia Electric Railway.

Traffic

James J. King, chief clerk of the Akron, Canton & Youngstown, has been appointed chief of the tariff bureau, with headquarters at Akron, Ohio.

John Davidson has been appointed convention traffic agent of the Canadian Pacific. His duties will entail traveling all over the Dominion of Canada and the United States to procure conventions for Canadian cities.

Walter Gray and **H. L. Blackstone,** general agents of the Kansas City, Mexico & Orient at Los Angeles, Cal., and San Francisco respectively, have been appointed to similar positions on the Panhandle & Santa Fe at the same points. **W. J. Tilton,** general live stock agent of the Kansas City, Mexico & Orient, has been appointed livestock agent of the Panhandle & Santa Fe, with headquarters as before at San Angelo, Tex.

Mark Fenton, who has been appointed general industrial agent of the Illinois

Central, with headquarters at Chicago, has been connected with that railway for 27 years. With the Illinois Central he served as industrial agent and as development agent. During the 10 years that he was out of railroad service Mr. Fenton was engaged successively as industrial commissioner and manager of the Memphis (Tenn.) chamber of commerce, for two years in making industrial surveys of various cities and as a

Mark Fenton

lecturer in Ohio and Michigan, as industrial commissioner of the Illinois Chamber of Commerce at Chicago, executive vice-president of the Savannah (Ga.) board of trade and as executive president of the Utica (N. Y.) chamber of commerce. His appointment as general industrial agent of the Illinois Central became effective on July 15.

Operating

K. R. Ketchem, assistant trainmaster on the Chesapeake & Ohio at Jenkins, Ky., has been transferred to G. & E. Junction, W. Va.

Effective August 1, the Owensboro and Nashville division and that part of the Henderson division of the Louisville & Nashville extending from Atkinson to Ellmitch will be added to and operated as parts of the Owensboro division. **A. M. Stevenson** has been appointed superintendent of the Owensboro division, with headquarters at Owensboro, Ky.

G. F. McGettrick has been appointed car service agent of the Central Vermont, with headquarters at St. Albans, Vt. All correspondence and reports pertaining to car service matters heretofore sent to the General Manager's office will now be addressed to Mr. McGettrick.

Engineering, Maintenance of Way and Signaling

H. B. Reinsagen, principal assistant engineer of the New York Central Lines West of Buffalo, N. Y., has been promoted to assistant chief engineer, with headquarters as before at Cleveland.

H. M. Church, division engineer of the Hinton Division of the Chesapeake & Ohio at Hinton, W. Va., has been promoted to general supervisor of bridges and buildings, with headquarters at Richmond, Va.

A. A. Miller has resumed his duties as engineer of maintenance of way of the Missouri Pacific, with headquarters at St. Louis, Mo., succeeding **W. H. Vance**, who served temporarily as acting engineer of maintenance of way and who has returned to his former position of assistant engineer of maintenance of way at St. Louis.

Mechanical

Edward C. Richards, assistant to the superintendent of rolling stock of the Michigan Central, has been promoted to superintendent of rolling stock, with headquarters as before at Detroit, Mich., succeeding **J. T. Downs**, deceased.

Robert H. Nicholas, assistant master mechanic of the Central of New Jersey, with headquarters at Jersey City, N. J., has been appointed general locomotive inspector, with the same headquarters, succeeding **C. H. Van Why**, retired. The position formerly held by Mr. Nicholas has been abolished.

Special

Edward H. Sharpe, assistant manager of development and colonization of the Southern Pacific, with headquarters at San Francisco, Cal., has resigned to become director of public relations of the Aviation Corporation at New York.

* * * *

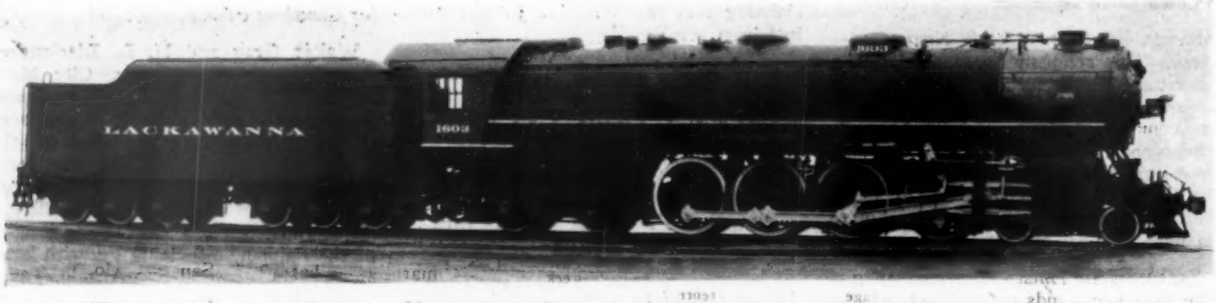
Obituary

R. D. Hawkins, general superintendent of motive power of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died on August 7.

John J. Kinsella, former superintendent of the car service and assistant superintendent of the Chicago Junction, with headquarters at the Union Stock Yards, Chicago, died at his home in Chicago on August 4 at the age of 76 years. Mr. Kinsella had served the Chicago Junction in the capacities of trainmaster, assistant superintendent and superintendent of car service from 1910 until his retirement in 1928.

George A. Mitchell, who retired from active service in 1925 as superintending engineer of bridges of the Central region of the Canadian National with headquarters at Toronto, Ont., died in that city on July 25. For more than 25 years previous to 1923, when he was appointed superintending engineer of bridges of the Canadian National, Mr. Mitchell had served at Toronto as master of bridges and buildings and superintendent of bridges and buildings of the Grand Trunk (now part of the former road) at Toronto.

Ernest S. Mudge, valuation engineer of the Western lines of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., died on July 12 after an extended illness. Mr. Mudge had been connected with the Santa Fe for more than 35 years. He was born on June 9, 1874, at Brooklyn, N. Y., and spent his early life at Eskridge, Kan., and Manhattan. After attending the Kansas State Agricultural College from 1889 to 1891, he entered railway service in January, 1894, as a chainman on the Santa Fe at Newton, Kan. He was then promoted successively to rodman, transitman and assistant engineer and in 1907 he became division engineer at Wellington, Kan. Mr. Mudge was transferred to Amarillo in 1915 and in 1918 he was promoted to valuation engineer of the Western lines.



Delaware, Lackawanna & Western "Pocono" 4-8-4 Type Locomotive Built for Fast Freight Service by the American Locomotive Company

Cylinders, 28 in. by 32 in.—72-in. diameter driving wheels—Boiler pressure, 235 lb.—weight on drivers, 262,000 lb.—Tractive force, 71,600 lb.